OCT 26 1922

Credit Situation Sound—Page 1118

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Strip Mills
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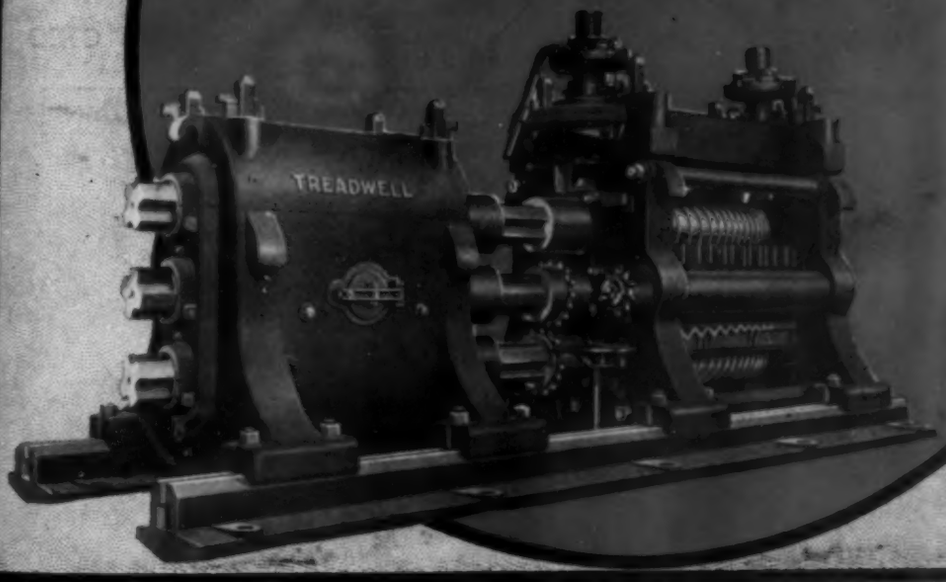
Special Mill Accessories
Charging and Ingot Cars
Reversing Valves for Open Hearth Furnaces
and Soaking Pits, Keller Patent



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TRUSCON STEEL CO

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7½	27¾	30	30
9½	33¾	36	36
10½	39¾	42	42
11½	45¾	48	48
12			54
			60
			66
			72

Special sizes made on order

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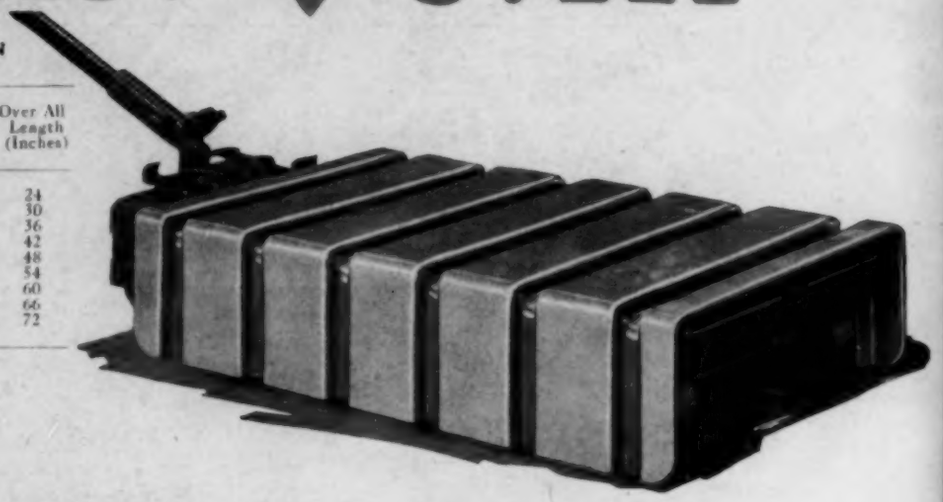

Keep All Materials Off the Floor

Truscon Boxes

For convenience in handling small parts and packages, we make skeleton boxes which fit on any size platforms which we make. Welded securely to platform or equipment with steel stakes which fit into ribs of platform. Boxes are 12", 18" or 24" deep.

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TRUSCON STEEL COMPANY

YOUNGSTOWN OHIO

Representatives in Principal Cities

IRON TRADE REVIEW
Registration Applied For
The Authority of Industry National and International

Vol. LXXI Cleveland, October 26, 1922 No. 17

Easier Conditions Developing

Transportation Congestion Shows Slight Relief—Continued Fall of Coke Market Brings Further Readjustments—Steel Market More Variable Though Tubes Advanced $4 to $5—Steel Corporation Buys 40,000 to 50,000 Tons of Semifinished

EASIER conditions both in transportation and in fuel are the governing factors of the present iron and steel market. Changes in the traffic situation are not marked but they have brought some relief especially in the Mahoning valley where the tonnage moved the past week shows a gain. Pittsburgh territory still is making little or no headway against the large accumulation of finished product in mill yards but has been able to escape much addition to this tonnage. The sharply falling coke market with its significance in iron and steel costs continues to bring with it readjustment of prices in certain lines. While this process continues, new business in iron and steel apparently is under check and the volume is less.

Coke prices have continued to fall and this week are down to $8 ovens for 48-hour Connellsville fuel, a further decline of $1.50 per ton. Several furnace interests have been buyers of round tonnages at this price. The market now is off $5 per ton from the late September and early October level. Increased production of coal and coke is the basis for the present weakness of the market. Coke output in the Connellsville region is close to 150,000 tons weekly or equal to the high point just before the coal strike.

The trend of IRON TRADE REVIEW composite of fourteen iron and steel products still is downward. The composite this week is $43.42 against $43.56 last week and $43.88 two weeks ago.

Corporation in Market

Shortages of steel due to transportation trouble have continued to interfere with finishing mill operations in various quarters. This has brought the Steel corporation into the market as a buyer of semifinished material for the first time in several years. Through its sheet and tin plate subsidiary, it bought from independent producers the past week 40,000 to 50,000 tons of sheet bars and slabs. Most of the tonnage was closed on the basis of $40 Youngstown or its equivalent though at least one lot went at $39.50. Of the total, 20,000 tons from an eastern producer was at $38 mill or the equivalent of higher than $40 Youngstown.

New inquiries for freight cars this week total 10,990 with awards aggregating 2300. Structural steel lettings of the week were fair with 17,697 tons total. American producers have lost to British competition, a contract for 10,000 tons of bridge work for the East Indian state railways. The Steel corporation however, has secured 3000 tons of similar work for Uruguay.

Prices Are Variable

An advance of $4 to $5 per ton in steel pipe by the National Tube Co., subsequently adopted by the independents points to the strong market in this product. A higher tin plate price for first quarter because of present costs is foreshadowed. The mills have been refusing addition business and an inquiry for 150,000 boxes from the Standard Oil Co. of New Jersey is less attractive to them. In other lines, less firmness is shown. In black sheets, some independents are back to 3.35c Pittsburgh. Two mills have quoted steel bars at 1.95c.

Pig iron has shown some further recession this week at Pittsburgh, Cleveland, Buffalo and in eastern Pennsylvania. New orders are light with spot demand best. Purchases of 15,000 tons of basic by a northern Ohio steelmaker have better clarified the market on this grade at $30 valley or lake furnace. A report this week that the Steel corporation had bought iron is not confirmed.

British imports of pig iron and ferromanganese to this country in September are reported from abroad as 52,600 tons. This indicates that the total of foreign pig iron received by American buyers the past three months has been close to 75,000 tons. A lot of 5000 tons of Lorraine foundry iron was sold to this country at the equivalent of $17.25 f.o.b. Antwerp.

Ore Rates Upheld

Upholding by the examiner for the interstate commerce commission, of the present rail freight rates on Minnesota iron ore with recommendation of reductions on Old Range tonnage is favorable to the Steel corporation. This is due to the latter's ownership of ore roads in Minnesota and to its participation, at the same time, in the reductions to the Wisconsin mines where it controls no roads. The finding is likely to have an important bearing on next season's ore prices. Independent ore and steel producers are protesting adoption of the report.

Business Trend and Chart Section Page 1117

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A Fruitful Field for Research

IN COMPARISON with the great mass of information constantly published for the benefit of engineers, metallurgists, and members of the operating staffs in the iron and steel industry, the literature of distribution and salesmanship is practically insignificant. Young men aspiring to positions in the technical branches of iron and steelmaking have opportunities for preliminary training in the engineering colleges and in special apprenticeships in the works. The would-be salesman, on the other hand, aside from the doubtful assistance of the commercial courses offered by some of the universities, must seek his training in the hard school of experience.

Considering the importance of salesmanship and the crying need of the development of more efficient methods of distribution, it is surprising more attention has not been given to the marketing of iron and steel. It is true that sales managers are conscientious in training salesmen to be more than mere "order takers" yet it seems that in thus focusing attention on the ever-present task of filling mill order books, the more general and more far-reaching problems are disregarded.

Mere salesmanship may be likened to the routine of mill operation; the salesman produces orders while the mill or furnace superintendent produces iron or steel. But when we come to the engineering or research department on the technical side, we find no counterpart in sales division of the industry. Whereas hundreds of specialists are seeking to develop new and better methods of production, few if any qualified experts are given sufficient freedom from sales routine to enable them to advocate adequate attention to the broader aspects of distribution.

A properly directed campaign of research work on methods of distributing iron and steel would open up unlimited possibilities. The program naturally would include an investigation of possible new uses of steel, a campaign for the revision of antiquated building codes having specifications for structural steel that have remained unchanged for 20 years, a study of the standardization of bars and shapes with a view of eliminating hundreds of sections that are not in sufficient demand to warrant economical production, an analysis of the seasonal demand for certain products in order to effect means of levelling peaks and valleys in mill operation, an unbiased survey of the cost of distributing through jobbers as compared with that of direct solicitation with the object of arriving at the most economical system of selling, and dozens of other tasks.

The benefits of investigation along these lines would be cumulative. New avenues of distribution would be discovered; the greater number of buyers would tend to minimize the "feast or famine" aspect of the business; and the more evenly distributed demands upon the mills would promote greater operating efficiency, which means cheaper steel and more certain profits.

Linking Economics and Industry

THE breadth and scope of the program at last week's annual convention of the Society of Industrial Engineers clearly reflected the great progress which has marked the profession of industrial engineering. The question as to why the industrial engineer is not accepted by industry in this country in a manner comparable with the recognition generally accorded the electrical, the mechanical and the other better-known kinds of engineers, can in no way be construed as reflecting against the status of the industrial engineer. It is asked simply because the industrial engineer is a newer engineer, and his profession has not been as thoroughly developed as that of the older branches of engineering.

No profession, in fact, could be more useful than that of the industrial engineer if he works in accordance with his ideals. The advanee of civilization, and the increasing scarcity of labor, at least in this country, are having the effect of making men more precious. Relations between employer and employe which are based upon mutual understanding constitute a vitally important branch of industrial engineering. In general, the term industrial engineering may be regarded as the application of economics to industry. Economic

facts not only underlie labor relations; they underlie all problems of distribution, of management, of the success of an industry. All of these matters properly come within the scope of the industrial engineer. There is no question as to the usefulness of industrial engineering as a profession. It simply is a question of the industrial engineer embracing his opportunities. On the degree in which he measures up to them, will depend his status in the years to come.

In the meantime the industrial engineer should be the benefit of the doubt. Industrial executives, by patronizing the industrial engineer, must realize that in helping the latter to develop, they are creating a new source of help for solving the increasing complex problems of industry.

Labor Board Needs Strengthening

SHORTLY after Secretary of Labor Davis came out publicly for abolition of the railroad labor board and transfer of its functions to the department of labor it was stated at the White House that, instead of acquiescing, the President plans to submit to congress in December amendments to strengthen those provisions of the Transportation act creating the board. This pithy but timely pronouncement snatched from the American Federation of Labor, an implacable foe of the board, what comfort it derived from this interior attack upon the latter and closed the incident.

The effort—doubtless well-intended—of Secretary Davis to enlarge his department has had the effect of throwing new light upon its weakness. The department was created at a time when labor difficulties were arbitrated, when the judgment of a disinterested, third party was invoked in industrial strife. But now labor spurns arbitration, it puts forth its minimum terms of settlement and lays siege to capital. Whichever side can hold out the longer wins. So, in these days of what labor prefers to designate collective bargaining, not much is left to the department of labor. It oversees immigration, collects voluminous statistics and operates a women's bureau.

Had the department of labor fully met the need of a mediating body in the railroad industry, the labor board would not have been created in 1920. The board is far from a perfect piece of machinery, its parts are only beginning to wear in. For one thing, it should be moved from Chicago to Washington, to permit contact with the interstate commerce commission, which regulates the rates which are largely distributed by the board among the railroad workers. Presumably, this is one of the perfecting proposals the President has in mind.

The labor board did not function faultlessly during the recent shopmen's strike but certainly it did more toward effecting an adjustment of that difficulty than the department of labor did toward ending the parallel coal-miners' strike. The department had a magnificent opportunity to render a real public service, but it was impotent. Certainly its record would not warrant entrusting it with railroad peace. The logic of the labor situation today points to further experimentation along the line of the railroad board.

Every Week

Executives Carefully Read IRON TRADE REVIEW and Business Trend Section

IT HAS been the writer's custom in the past to read such articles in your magazine as were marked for his attention. Since the inauguration of the Business Trend section, the writer has read your magazine weekly with considerable interest and you are to be complimented for the great assistance this section will undoubtedly give business executives.—*Brooke L. Jarrett, president, Calorizing Co., Pittsburgh.*

The writer is glad to tell you that IRON TRADE REVIEW is proving to be of the value that he expected to receive from same when he became a subscriber. Your added feature covering the Business Trend has been very interesting to the writer and same has been found very valuable.—*The Columbia Steel Casting Co., Elyria, O., C. R. Hallock, assistant treasurer.*

We have found IRON TRADE REVIEW extremely valuable and we will particularly endorse your weekly charts.—*L. P. Barrett, mining geologist, department of conservation, Geological Survey Division, Lansing, Mich.*

Steel Capacity Not Price Test

PRIOR to the war the relation of steel production to capacity had a direct bearing on prices of steel products. Because of the increasing importance of certain modifying factors, this relation at the present time does not apply in the usual way. The car shortage makes it impossible for various industries, both steel consuming and producing, to operate at 100 per cent and this promises to be a factor of major influence for an indefinite period. The labor shortage is having the same effect. As long as immigration is restricted as at present, the labor supply of types especially required by the steel industry will be far less than demanded and in all probability this deficiency will become more acute. Because of these factors it would be impossible for the steel industry to operate at capacity now or in the indefinite future.

In basing their conclusions as to the effect of production percentage on steel prices, both producers and consumers must take these factors into account. Recent experience would tend to indicate that, unless the steel industry is to receive preferment in transportation and labor supply, 75 per cent is the practicable maximum operating rate under present conditions.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

October 25, 1922	October 18, 1922	September, 1922	July, 1922	October, 1921	October, 1913
$43.42	$43.56	$43.79	$37.50	$35.46	$24.91

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

SCRAP PRICES, PAGE 1162, WAREHOUSE, PAGE 1154, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1158

Iron and Steel Prices

Pig Iron

Bessemer, valley	$33.00
Bessemer, Pittsburgh	34.77
Basic, valley	30.00
Basic, Pittsburgh	31.77
Basic, Buffalo	30.00 to 31.00
Basic del., eastern Pa.	30.00 to 31.25
Malleable, valley	31.00 to 32.00
Malleable, Pittsburgh	32.77 to 33.77
Malleable, Chicago	31.00 to 32.00
Malleable, Buffalo, furnace	30.00 to 31.00
Malleable, del., eastern Pa.	32.00 to 32.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	33.13 to 33.64
No. 1X, Buffalo	30.50 to 32.50
No. 2 foundry, valley	30.00 to 31.00
No. 2 foundry, Pittsburgh	31.77 to 32.77
No. 2 foundry, Buffalo	29.50 to 31.00
No. 2 foundry, Chicago	31.00 to 32.00
No. 2 foundry, Granite City	33.00 to 34.00
No 2 foundry, Ironton furnace	32.00
No. 2 foundry, Cleveland del.	33.50
No. 2 foundry, del., Phila.	31.13 to 31.64
No. 2 foundry, N. J. tidewater	31.13 to 33.02
No. 2X, eastern del., Phila.	32.13 to 32.64
No. 2X, east. N. J. tidewater	32.13 to 34.02
No. 2X, eastern del. Boston	36.65 to 38.65
No. 2X, foundry, Buffalo fur.	30.00 to 32.00
No. 2X, Buffalo del. Boston	37.91 to 38.91
No. 2 southern, Birmingham	27.00 to 28.00
No. 2 southern, Cincinnati	31.05 to 32.05
No. 2 southern, Chicago	33.01 to 34.01
No. 2 southern, Philadelphia	34.80 to 35.80
No. 2 southern, Cleveland	33.01 to 34.01
No. 2 southern, Boston (rail)	36.61 to 37.61
No 2 southern, St. Louis	32.17 to 33.17
No. 2X, Virginia furnace	33.00
No. 2X, Virginia Philadelphia	38.17
No. 2X, Virginia Jersey City	38.54
No. 2X, Virginia Boston	38.92
Gray forge, eastern Pa.	29.50 to 30.50
Gray forge, val. del. Pitts.	32.77
Low phos., standard, valley	37.00 to 38.00
Low phos., standard, Phila.	41.00
Low phos., Lebanon furnace	35.00 to 37.00
†Low phos., British tidewater	29.00 to 30.00
Charcoal, Birmingham	32.00 to 35.00
Charcoal, Superior, Chicago	36.15

Silvery Iron
Jackson County, Ohio, furnace

8 per cent	$41.50
9 per cent	43.50
10 per cent	45.50
11 per cent	48.80
12 per cent	52.10

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	$50.50
11 per cent	53.00 to 53.80

Ferroalloys

Ferromanganese, 78 to 80 per cent domestic, f.o.b. furnace	$100.00
Ferromanganese, British delivered, Pittsburgh	105.89
†Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	101.10
Spiegel, 19 to 21 per cent furnace spot nominal	37.00 to 38.00
†Spiegel, 20 per cent English, c.i.f. Atlantic port	38.50
Ferrosilicon, 50 per cent contract freight allowed	70.00 to 75.00
Ferrotungsten, standard, per pound contained	85.00 to 95.00
†Duty paid.	
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	12.00c to 14.00c
Imported ferrochrome, 4 to 6 per cent carbon	12.00c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$8.00 to 9.00
Connellsville foundry	10.00 to 12.00
Pocahontas furnace	10.00 to 11.00
Pocahontas foundry	13.00 to 14.00
New River furnace	11.00 to 12.00
New River foundry	13.00 to 15.00
Wise county furnace	9.00 to 10.00
Wise county foundry	12.00 to 13.00
Alabama furnace	7.50 to 8.50
Alabama foundry	8.00 to 9.00

By-Product

Foundry, Newark, N. J., del.	$14.84 to 16.02
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	16.50
Foundry, Granite City, Ill., ovens	14.00
Foundry, Alabama	8.50 to 10.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4 inch)

Open-hearth, Pittsburgh	$40.00
Open-hearth, Youngstown	40.00
Open-hearth, Philadelphia	45.17
Bessemer, Pittsburgh	40.00
Bessemer, Youngstown	40.00
Forging, Pittsburgh	45.00 to 50.00
Forging, Philadelphia	50.17

SHEET BARS

Open-hearth, Pittsburgh	$39.50 to 40.00
Open-hearth, Youngstown	39.50 to 40.00
Bessemer, Pittsburgh	39.50 to 40.00
Bessemer, Youngstown	39.50 to 40.00

SLABS

Pittsburgh and Youngstown	$40.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$45.00 to 47.50
Grooved skelp, Pittsburgh	2.00c to 2.25c
Universal skelp, Pittsburgh	2.00c to 2.25c
Sheared skelp, Pittsburgh	2.00c to 2.25c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c to 2.25c
Structural shapes, Phila.	2.275c to 2.425c
Structural shapes, New York	2.29c to 2.44c
Structural shapes, Chicago	2.10c to 2.25c
Tank plates, Pittsburgh	2.00c to 2.25c
Tank plates, Philadelphia	2.275c to 2.575c
Tank plates, New York	2.29c to 2.59c
Tank plates, Chicago	2.10c to 2.30c
Bars, soft steel, Pittsburgh	1.90c to 2.25c
Bars, soft steel, Philadelphia	2.225c to 2.425c
Bars, soft steel, New York	2.24c to 2.44c
Bars, soft steel, Chicago	2.00c to 2.25c
Bars, forging, Pittsburgh	2.60c to 2.75c
Bars, rail steel, Chicago	2.00c
Reinforcing bars, Pittsburgh	2.00c to 2.25c
Bar iron, common, Phila.	2.325c to 2.375c
Bar iron, common, New York	2.34c to 2.39c
Bar iron, common, Chicago	2.50c

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.90c to 3.25c
Bands, Pittsburgh	2.90c to 3.25c
Cotton ties, per bundle Pittsburgh	$1.13
Cold finished steel bars, Pittsburgh base	2.50c to 2.75c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open hearth rails, mill	43.00
Relaying rails, St. Louis	28.00 to 35.00
Relaying rails, Pittsburgh	28.00 to 32.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.75c to 3.00c
Spikes, small and boat	3.50c to 3.75c
Spikes, railroad, Chicago	2.85c to 3.00c
Track bolts, Pittsburgh	3.85c to 4.50c
Track bolts, Chicago	3.85c to 4.00c
Tie plates, Pittsburgh	2.25c to 2.35c
Tie plates, Chicago	2.35c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.70c
Plain and annealed wire, Pitts.	2.45c
Galvanized wire, Pittsburgh	2.95c
Barbed wire, painted, Pitts.	2.85c
Barbed wire, galv., Pittsburgh	3.35c
Polished staples, Pittsburgh	2.85c
Galvanized staples, Pittsburgh	3.35c
Coated nails, count keg, Pitts.	2.20c
Woven wire fencing (retailers)	68 off
Woven wire fencing (jobbers)	70½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.05c to 2.30c
Hot rolled strip steel, Pittsburgh stamping quality	2.90c to 3.25c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.50c

Sheets*

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.75c
No. 28, bessemer, Pittsburgh	3.35c to 3.75c
No. 28, open-hearth, Phila.	3.675c to 3.825c
No. 28, open-hearth, Chicago	3.64c to 3.69c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.75c
No. 28, open-hearth, Chicago	3.69c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.35c to 4.75c
No. 28, bessemer, Pittsburgh	4.35c to 4.75c
No. 28, open-hearth, Phila.	4.675c to 4.825c
No. 28, open-hearth, Chicago	4.64c to 4.69c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.50c to 2.85c
No. 10, bessemer, Pittsburgh	2.50c to 2.85c
No. 10, open-hearth, Phila.	2.825c to 3.075c
No. 10, open-hearth, Chicago	2.84c to 2.89c

*Lowest prices represent American Sheet & Tin Plate Co. schedule.

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	66	54½
1 to 1½-inch, butt iron	34	19

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c.	48 off
Charcoal iron, 3¼ to 4½ inches l. c. l.	16 off
Seamless, hot rolled, 3¼ to 4-in., l. c. l.	45 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$56.20
Six-inch and over, Chicago	52.20
Four-inch, New York	60.30
Six-inch and over, New York	55.30
Four-inch, Birmingham	47.50 to 48.00
Six-inch and over, Birmingham	43.00 to 43.50
Three-inch, Birmingham	56.50 to 57.00

Class A pipe is $4 higher than Class B.
Standard fittings, Birmingham, base, $110.00
6 to 24-inch, base; over 24-inch plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Oct. 25, 1922	Sept. 1922	July 1922	Oct. 1921
PIG IRON				
Bessemer, valley, del., Pittsburgh.	$34.77	$35.27	$26.76	$22.06
Basic valley, del., Pittsburgh....	31.77	34.27	26.76	21.16
*No. 2 foundry, del., Pittsburgh..	31.77	37.02	26.16	22.96
*No. 2 foundry, Chicago.....	31.00	32.00	24.65	21.50
Lake Superior charcoal, Chicago.	36.15	36.15	31.65	32.50
Malleable, valley	31.00	34.00	24.25	20.25
Malleable, Chicago	31.00	32.00	24.65	21.50
*Southern No. 2, Birmingham...	27.00	26.25	18.50	19.00
*Southern Ohio, No. 2 Ironton..	32.00	33.75	24.15	21.00
Basic eastern del., eastern Pa....	31.00	30.00	26.00	20.50
**No. 2X, Virginia furnace.....	33.00	33.00	26.00	23.25
**No. 2X, eastern del. Phila.....	32.13	34.25	27.90	22.00
Gray forge val. del., Pittsburgh..	32.77	36.02	25.76	21.96
Ferromanganese, del., Pittsburgh.	105.89	80.69	72.29	61.65
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh..	39.50	39.50	35.00	31.50
Sheet bars, open-hearth, Pittsburgh	39.50	39.50	35.00	31.50
Billets, bessemer, Pittsburgh.....	40.00	39.50	35.00	30.00
Billets, open-hearth, Pittsburgh...	40.00	39.50	35.00	30.00
FINISHED MATERIAL—				
Steel bars, Pittsburgh	2.00	2.00	1.70	1.60
Steel bars, Chicago	2.00	1.98	1.75	1.75
Steel bars, Philadelphia	2.325	2.375	2.025	1.95

*1.75 to 2.25 silicon

	Oct. 25, 1922	Sept. 1922	July 1922	Oct. 1921
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.325	$2.325	$2.00	$1.95
Iron bars, Chicago mills.....	2.50	2.25	1.90	1.75
Beams, Pittsburgh	2.00	2.00	1.70	1.60
Beams, Philadelphia	2.325	2.375	2.025	1.95
Beams, Chicago	2.10	2.08	1.75	1.78
Tank plates, Pittsburgh.....	2.00	2.20	1.70	1.60
Tank plates, Philadelphia	2.325	2.575	2.025	1.95
Tank plates, Chicago.....	2.10	2.08	1.75	1.78
Sheets, blk., No. 28, Pittsburgh..	3.50	3.40	3.15	3.00
Sheets, blue anl., No. 10, Pitts..	2.60	2.50	2.40	2.50
Sheets, galv., No. 28, Pittsburgh.	4.50	4.40	4.15	4.00
Wire nails, Pittsburgh	2.70	2.70	2.40	2.90
COKE—				
Connellsville furnace, ovens.....	8.00	11.00	10.65	3.25
Connellsville foundry, ovens.....	10.00	12.75	11.40	4.50
OLD MATERIAL—				
Heavy melting steel, Pittsburgh..	21.00	19.50	16.60	14.00
Heavy melting steel, east. Pa....	18.00	17.10	15.00	12.25
Heavy melting steel, Chicago ..	18.50	18.15	15.10	12.50
No. 1 wrought, eastern Pa.....	22.50	21.25	18.25	15.85
No. 1 wrought, Chicago.....	20.25	19.95	15.20	14.65
Rails for rolling, Chicago.....	20.50	19.40	16.00	14.00

**2.25 to 2.75 silicon

Pig Iron Market Still Settling

Lower Prices Appear at Pittsburgh, Cleveland, Buffalo and Eastern Pennsylvania in Conformity With Falling Coke Market—15,000 Tons of Basic Sold to Ohio Steelmaker—New Buying Restricted—Spot Iron in Demand

Chicago, Oct. 24.—Spot demand for northern pig iron is in excellent volume at $31. While sales of carloads on track at $32 are being made to melters in urgent need of material, the general market is steady at $31 for all grades. Inquiries are light and few sales are reported for the first quarter. Some buying is being done through January. The present rate of buying of prompt iron through this year will cover the production of active stacks. Some melters are buying more heavily as their castings sales increase and a decided change in this direction is noted in the past few days. Malleable iron is especially in demand as deliveries are slow from two stacks held back by lack of fuel. A Wisconsin user has bought 1500 tons of malleable iron at $31; a Michigan foundry 300 tons of foundry iron at the same price; and another Michigan melter 500 tons of the same material at $31. Silveries are inactive and charcoal iron is in small demand. Prices are unchanged. A Wisconsin user is understood to have purchased a tonnage of foreign low phosphorus iron under the domestic price.

Foreign and Domestic Easier

Philadelphia, Oct. 24.—Pig iron demand is in the doldrums. Prices are easier, both for foreign and domestic. Eastern foundry iron in the past week was sold at $30 furnace for No. 2 plain, 1.75 to 2.25 silicon, plus $1 differentials. There were no sales of standard foundry under $30 but less could be done on large tonnages. At the same time carload sales were as high as $31 and $31.50 base. Prices on foreign foundry vary from $22.50 to $30 depending upon quality and delivery. In some cases spot arrival is offered at less than futures, due to difficulty in finding immediate takers. English copper-free low phosphorus is quoted at $29 to $30 duty paid. There is some further business in this grade. There is a disposition to route foreign iron to other ports due to the Philadelphia longshoremen's strike which is proving serious. Virginia iron has been sold at $32 base plus $1 differential but the total is not large.

Virginia blast furnaces, which have either blown in or are about to blow in, faced a possible coke shortage until the Norfolk & Western and Chesapeake & Ohio railroads were assured an ample supply of cars. The railroads have granted reduced rates to become effective in the near future but without an adequate supply of cars, the effect of the lower rates would have been nullified.

Eastern Prices Lower

New York, Oct. 24.—While a fair tonnage of pig iron has been bought by consumers in this district during the past week, the demand has decreased materially. At the same time,

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domestic production in the East is increasing. Prices have fallen off. Eastern Pennsylvania and Buffalo foundry irons have sold at $30, furnace, for the 1.75 to 2.25 silicon grade, $31 for 2.25 to 2.75 and $32 for 2.75 to 3.25 silicon. It is rumored that Buffalo foundry has been sold below $29, base, and that eastern Pennsylvania foundry has been offered under $30, base. Nothing is definitely known to have been sold or offered, however, under $30. Due to the easier coke supply, some makers unable to deliver in accordance with contracts now are shipping at a better rate. Makers that have been inactive for months due to lack of coke, now are going in or preparing to become active. The Eastern Steel Co. again is offering iron. A report that Witherbee, Sherman & Co. were about to blow in their port Henry furnace on foundry iron is incorrect.

Spot and nearby arrival foreign iron can be had several dollars lower. English and continental foundry iron equivalent to standard 2.25 to 2.75 and 2.75 to 3.25 silicon grades is offered at $27, duty paid. For later shipment from abroad, $26, duty paid, tidewater, is quoted. Scotch iron of about the same analysis for spot and nearby arrival is $29 to $29.50, tidewater, or $3 to $4 less than several weeks ago. Some further small sales of English copper-free low phosphorus iron have been made at $30, c.i.f. tidewater, or $30.75, duty paid. The iron has been sold with guarantee of phosphorus and sulphur not to exceed 0.035 per cent, copper not to exceed 0.015 per cent, and silicon between 1 and 2 per cent. The price of English low phosphorus effectually has put domestic iron of this grade out of the competition, excepting for occasional small lots for immediate shipment.

Virginia foundry continues to be offered at $32, furnace, for 1.75 to 2.25 silicon, plus $1 differentials for silicon, and one Virginia maker also asks manganese differentials. Central Pennsylvania foundry iron has been bringing around $33 and $34, furnace, for 2.25 to 2.75 silicon, but most of the tonnage from the stacks has been sold nearby or to Pittsburgh and similarly located points. Practically all the railroads have embargoes against pig iron shipments to New England.

Market Is More Clarified

Pittsburgh, Oct. 24.—The pig iron market is more clearly defined than at any time in the past three or four weeks. While one or two cases are noted where a special figure has been named upon basic due to certain circumstances, $30 valley is considered fairly representative of the market and that has applied on sales up to 5000 tons at a time. The Central Steel Co., Massillon, O., purchased a tonnage of that size from a Cleveland interest. Two or three valley producers are quoting that price and the scrap interest which has a large tonnage for sale is understood to have settled upon that figure as the minimum. The Allegheny Steel Co. Brackenridge, Pa., is reported to be offering to buy basic at lower figures but without success. A nearby consumer recently closed with a valley producer on 3500 tons for delivery before December. Other lots of 100 tons or so at a time are noted. In bessemer, several sales are reported involving an aggregate of between 500 and 1000 tons at $33 valley which remains the quotable market. A malleable foundry here has closed upon 2000 tons of malleable iron at $32, Johnstown, Pa. Valley producers continue to quote $31 to $32 with the same freight rate to Pittsburgh, meeting the Johnstown, Pa., competition. No. 2 foundry iron (1.75 to 2.25 silicon) has been sold at $30 and $31 valley, $1 to $2 per ton below the market of a week ago. Even small sized lots have brought $31 to $31.25 valley although a few days ago $32 to $33.50 were easily obtainable on 50 and 100-ton lots. At the present time few inquiries for any grade are current and producers report that they find it necessary to seek out buyers instead of having the approach made by the consumer as was the case several weeks ago. Low phosphorus copper-free iron continues to be bought in small lots, 50 or 100 tons at a time at from $37 to $38 valley. A valley interest has just sold two 500-ton lots at those figures.

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Buffalo Prices Are Lower

Buffalo, Oct. 24.—Lower prices again are in evidence though the market is so variable as to make a wide spread cover current transactions. There is little doubt a large quantity of foundry iron of the 1.75 to 2.25 silicon content has been sold here at $29.50 and the softness has led to a narrowing of the differentials making No. 2X (2.25 to 2.75 silicon) $30 and No. 1X (2.75 to 3.25 silicon) $30.50. At the same time makers report sales, notably two instances, where No. 2X iron was sold in 100 and 150-ton lots at $34. Other makers believe the No. 2 plain market is $30 to $32. Malleable is selling at $30 to $31. No additional stacks have been lighted in this district.

Last Quarter Buying Declines

Boston, Oct. 24.—New England pig iron consumers apparently are fairly well covered for the balance of the year, and further buying for prompt delivery therefore is largely dependent upon the rate at which shipments come through from furnaces. The movement of freight and the car supply are being closely watched, as melters seem reluctant to overbuy at present prices. First quarter pig iron is in fair demand with sales exceeding 1000 tons for the past week. Prices in general in this market have held firm since the slight decline the middle of the month. Good grades of Scotch iron are selling at from $29 to $30 c.i.f. Boston with continental iron $2 below these prices. A Buffalo interest is understood to be selling last quarter iron at $31, furnace for No. 2X, 2.25 to 2.75 silicon, which means $35.91 delivered New England. Eastern Pennsylvania iron is offered at $32 at the furnace for 1.75 to 2.25 silicon, and $33 for No. 2X. Higher silicon differentials are being shaded in some cases. A lot of 100 tons of 2.75 to 3.25 silicon iron from eastern Pennsylvania is reported sold at $35.65 delivered. A Boston interest closed for 1000 tons ten days ago, and is in the market for 450 tons adtional. General inquiry is for small tonnages only.

Market Is $1 Lower

Cleveland, Oct. 24.—Under the influence of an easier coke situation and lower pig iron prices in nearby territories, the quotation on iron for delivery in Cleveland has fallen off to $33, furnace, for No. 2 foundry or a decline of $1 in the week. A week ago another lake furnace interest was selling at $31.50 in territory east and west of Cleveland, and has now reduced to $30.50. At this figure iron could be shipped into Cleveland from one quarter at a delivered price of $32.46, and from another at $33.27. This interest booked 3500 tons, some of it going at $31, base, furnace, before the price was reduced another 50 cents. The tonnage included an 800-ton lot to a northern Ohio consumer, and around 1000 tons of malleable iron in smaller amounts. The seller offering iron at $33 for Cleveland delivery booked 400 tons at this figure.

The market generally is dull, and few inquiries are current, among them being one for five carloads of foundry for Fairmont, W. Va. An offer of a sizable tonnage would probably develop lower prices.

More definite information is at hand in regard to the sale of 10,000 tons of basic by a lake furnace interest at $30, furnace, for promot shipment, reported a week ago. The central Ohio steel company making this purchase also closed in the week with another lake furnace interest for 5000 tons of basic, at $30, furnace. Additional tonnages of basic are under negotiation. The sale of two carloads of 9 per cent silvery at $43.50 to a Cleveland consumer is noted.

Furnaces Planning to Resume

Cincinnati, Oct. 24.—With continued laxity in buying on the part of pig iron consumers, the conspicuous feature at present is the preparations for increased production particularly in the southern Ohio district. At least three and possibly four furnaces in Ohio and one in Kentucky that have been idle for varying periods may be in blast in the near future. The Globe Iron Co., Jackson, is about to fire its furnace and is only waiting for the delivery of coke. The Milton Iron Co., Wellston, and the Star Furnace Co., Jackson, are arranging to put in a stack each not later than the first week in November and the Marting Iron & Steel Co. is said to have arranged for a coke supply for the resumption of one furnace. The Norton Iron Works Co. plans to have its Norton furnace at Ashland, Ky., in blast within two or three weeks. Indications are that by the middle of November, 10 furnaces will be in production in this territory.

Buying continues light and there is scant inquiry. Local dealers have difficulty in getting spot iron, particularly in the South and the market is firmer than a week ago. With one single exception, southern furnaces are quoting $28 to $30, Birmingham base

and are refusing offered spot tonnage at $28.50. One Alabama furnace still has some iron for last quarter delivery at $27. The southern Ohio market is being maintained at $32 base, Ironton.

The Louisville & Nashville railroad is in the market for 780 tons of mixed grades for prompt delivery. A soil pipe manufacturer has inquired on 250 tons of northern foundry, an Illinois melter for 200 tons, a central Ohio consumer for 100 tons and three local foundry interests from 100 to 200 tons.

St. Louis Market Dull

St. Louis, Oct. 23.—The melt of pig iron in this district continues on a large scale. Consumers are anxious for deliveries of contract quotas and small quantities are being purchased for immediate delivery. However, virtually nothing is being done toward covering future needs. Consumers are disposed to wait in expectation of lower prices. There seems to be a concerted movement not to buy into the future at present quotations and to take as little as possible for prompt shipment. A number of foundries much in need of iron have refused to purchase. Sales in the last few days have been confined to carloads and up to 150 tons and the total will hardly reach 1000 tons. A number of inquiries have been received for first quarter delivery, but the majority are believed to be feelers. A slightly easier tone is noted in the market. One southern maker is reported to be willing to shade his recent quotation slightly and some resale northern iron at $31, Chicago, has appeared. On the other hand, no furnace interest is offering anything for first quarter under the prevailing prices, and large tonnages are not available at these figures. The St. Louis Coke & Chemical Co. reports the sale of 3000 tons of foundry iron to an Ohio melter for prompt shipment, and other small lots aggregating about 500 tons. A southern furnace sold 100 tons to a local stove manufacturer.

Quotations Are Weak

Birmingham, Ala., Oct. 23.—While furnace interests here assert that little of their probable output for the remainder of the year is unsold, pig iron quotations show a little weakness. Sales have been made on a basis of $27 for No. 2 foundry iron. Sellers are still asking $30 for spot iron. The highest price reported as being done in the past few days was $28.50. The surplus stock of iron on yards in Alabama will show further increase at the close of business this month for the reason that the railroad car supply has not improved as much as expected It is now believed books will be opened in a few days for 1923 delivery, inquiries being numerous. It is intimated present prices will be named. The Woodward Iron Co. has a furnace at Woodward out for repairs but blew in the second Vanderbilt furnace. The Sloss-Sheffield Iron & Steel Co. blew out a North Birmingham furnace for repairs. Repair work is being carried forward on four stacks. The supply of raw material is increasing, and hope is expressed that within another week there will be no trouble in intra-district transportation facilities.

Furnace Coke Sold at $8

Sizable Tonnages Placed by Several Large Consumers—Still Further Declines Expected in Connellsville Fuel

COKE PRICES, PAGE 1096

Pittsburgh, Oct. 24.—While in some directions it is believed that the downward course of beehive coke is checked, in others, still further declines are expected. The past week has seen further recessions, until $8 on standard low-sulphur, 48-hour fuel for blast furnace use was reached. The Pittsburgh Steel Co., M. A. Hanna & Co., and the Midvale Steel & Ordnance Co. bought sizable lots at that figure, although up to $9 has been paid for certain tonnages. The Midvale company which has blown in another furnace, closed on 15,000 tons at $8, ovens. The market on furnace coke is quotable today at $8 to $9, or $1.50 per ton below last week's level and about $5 per ton below the market late in September or early in October. The Eastern Steel Co. is in the market for about 5000 tons but in common with three or four other eastern furnaces it expects still lower quotations. These interests indicate that $7 or $7.50 is the level at which they will operate. Some of these require up to 10,000 tons monthly. The McKeefrey Iron Co. instead of blowing in its Leetonia, O., furnace is selling its coke and probably will not become active until after Jan. 1. The Connellsville furnace coke market at the moment shows a little strength in certain directions where $8.50 to $9 per ton are the minimum quotations on contracts. Some of the last named grade appearing on track in lots up to 30 cars has sold at below $6 per ton. On other lots, around $7 is realized. Little or no demand exists for these grades. Foundry coke is quotable at $10 to $11, ovens, with less demand than two weeks ago. On certain brands perhaps $12 to $13 are the going quotations but these makes usually are $1 to $2 above the coke market. Production according to the *Connellsville Courier* for the week ended Oct. 14 was 140,710 tons as compared with 126,350 tons the preceding week.

Prices Easier in East

New York, Oct. 24.—Coke prices have eased off materially during the past week and standard beehive foundry coke for spot shipment now is obtainable here at $12 to $13, Connellsville. The consumers in New England have covered for foundry coke over the first half of next year, to be billed at the market price prevailing at the time of shipment. When the New England makers opened their books for first half, the consumers lost no time in covering. The Seaboard By-Products Coke Co. continues to ship to its customers in this district at $14, ovens, for standard by-product foundry coke.

Foundry Fuel Prices Firm

Boston, Oct. 24.—Despite weakness of prices in the Connellsville district, the foundry coke market in New England holds firm and a fair demand for shipment is reported by nearly all dealers. Contracts for first half requirements have been closed during the past week following opening of the producers' books. The tonnage reported has been so heavy as to cause producers to consider closing books in the near future. The current delivered price on contract is $16.50 per ton.

Furnace Coke Offered at $8.25

Cleveland, Oct. 24.—An easier situation in Connellsville coke is evident from transactions in the past week. One of the northern Ohio furnace interests obtained 18 carloads of spot furnace coke at $9.50, ovens, at the beginning of the week, later closing for a small additional tonnage at $8.75, and subsequently receiving an offer of further tonnage at $8.25.

Prices Holding Firm

St. Louis, Oct. 23.—No change worthy of note has taken place in the coke situation in this district. The demand continues strong for all grades, and far in excess of supplies. Prices hold firm. The better known grades of eastern coke are higher than a week ago. Connellsville 72-hour foundry coke is held at $15. The leading east side by-product producer reports some increase in output and is booking limited orders for domestic and metallurgical sizes. This interest reports the car supply at its mines is only 30 to 50 per cent of normal. The Terre Haute by-product plant has resumed operations, and is offering coke here at $16, ovens.

Lower Prices Stimulate Sales

Cincinnati, Oct. 24.—The coke market in this district is easier, and there is a marked increase in spot buying and inquiry. Selling agencies have booked considerable tonnage for blast furnace interests, demand from this source being stimulated by lower prices. One Ohio furnace is said to have contracted for a good tonnage around $9, ovens. A large number of ovens in the Pocahontas field are being fired to supply tonnages recently contracted for by furnace interests. Negotiations have just been closed by a local dealer for the sale of 18,000 tons of Pennsylvania furnace by-product fuel. This tonnage was offered in the market in Pittsburgh for some time but found no takers at $10.50. The closing price is not known. Another local dealer booked orders this week for 40 cars of furnace coke for prompt delivery and for 14 cars of foundry fuel. Pocahontas foundry coke is available here for the first time in several months although the tonnage is limited and is quoted at $13 to $14, ovens. Some Pocahontas furnace coke has been sold here for prompt delivery at $11. The current quotation on this grade now is $10 to $11, ovens. Declines ranging from 50 cents to $2 a ton on Wise county furnace and foundry coke and New River foundry fuel are shown in revised schedules.

Bar Demand Still Heavy

Producers Are Disinclined To Commit Their Output Far Ahead—Some Additional Business Is Being Offered

BAR PRICES, PAGE 1096

Chicago, Oct. 24.—Soft steel bars continue in heavy demand and this remains the most active department of the finished steel trade. Better deliveries are possible, as the supply of cars for shipment of steel is decidely better. Mills are faced with a difficult problem to distribute their product to meet the requirements of consumers. It is impossible to satisfy the latter until production is greatly increased, but every effort is being made to avoid distress. Orders during the present month have been fully equal to the total of September up to this time, as far as other products than rails are concerned. Prices remain unchanged at 2.00c, Chicago, on the part of the leading producer and 2.10c, Chicago, a nominal quotation, by Inland Steel Co. Occasional prompt tonnages are possible to obtain at premiums.

The bar iron situation is unsatisfactory and one producer has closed down its mill until conditions improve. Another producer is rerolling steel on its iron bar mill. In spite of this situation the prevailing quotation of 2.50c, Chicago, mill, is not being shaded. Good inquiry for rail steel bars is being received from fence post makers, bedstead manufacturers, reinforced concrete builders and from agricultural implement makers. The quotation on this material is unchanged at 2.00c, mill.

Demand Still Heavy

New York, Oct. 24.—Mills having steel bars for prompt shipment continue to find it easy to book business at 2.10c and 2.15c, base Pittsburgh. Where deliveries are further off the market is 2.00c, base Pittsburgh. Bar demand continues brisk. The mills are discouraging the placing of forging bars and twisted concrete bars. On account of the shortage of labor they prefer to take on business involving the least amount of work. Iron bars now are obtainable in carload lots at 2.00c to 2.05c, base Pittsburgh.

Iron bars have been reduced by a leading eastern seller to 2.05c, Pittsburgh on material in carloads and 2.15c in less than carloads. Virtually all other sellers have conformed to this schedule. The reduction is attributed more to better production than to a marked falling off in demand.

Sizable Lots Presented Makers

Pittsburgh, Oct. 24.—Various buyers of merchant steel bars, already heavily covered to the end of the year, are presenting further tonnages. In some cases, these consist of orders up to and including 1000 tons at a time, mainly from cold-drawn steel bar makers. They usually consist of three or four sizes and hence are attractive from a rolling standpoint. Because producers are disinclined to commit themselves far ahead, however, it is rare when such orders are written upon the books. The majority of the merchant steel bar producers have obligated their entire output for the last quarter and on the basis of present operations cannot avoid carrying their tonnages into the first quarter of next year. While one valley producer is naming 1.95c, base Pittsburgh, to Cleveland customers, this amounts to 2.045c, Youngstown. The market holds firmly to a minimum of 2.00c, Pittsburgh, here with 2.10c, 2.15c and as high as 2.25c applying upon orders taken by such producers as the Cambria Steel Co. in lots up to 200 tons at a time. A mine car company recently ordered bars and plates and the Pennsylvania railroad too, was a recent buyer of merchant steel bars within this range. Refined iron continues unchanged except that 2.60c fast is disappearing and 2.75c is taking its place in a number of cases, particularly where small tonnages are involved.

Delivery Rules Prices

Buffalo, Oct. 24.—The price range on steel bars is from 2.00c Pittsburgh upward depending on delivery. Only on a few sizes is delivery being promised before 1923. Mill operation is at maximum.

Little New Buying Done

Cleveland, Oct. 24.—Not much new business in steel bars now is being placed in this territory. Even quotations of 1.95c Pittsburgh which have been offered here by two independent mills apparently have not been attractive to any considerable extent. Most of the mills still quote 2.00c, Pittsburgh with the Steel corporation subsidiaries credited with naming 1.90c upward. Consumers with orders on mill books are closely following up deliveries and conditions in the latter respect show some improvement.

Demand Is Smaller

Philadelphia, Oct. 24.—Steel bar demand is smaller but mills continue to obtain 2.10c and 2.15c, Pittsburgh, on spot tonnage. Attractive tonnages have been placed at 2.00c, Pittsburgh. Iron bars are being quoted 2.00c to 2.05c, Pittsburgh, and forging bars 2.25c, Pittsburgh.

Cold-Drawn Books Well Filled

Pittsburgh, Oct. 24.—Order books of the cold-drawn steel bar producers are well filled to the end of the year and into 1923. However, because the present price of 2.50c, base Pittsburgh, is so unattractive in view of high production costs prevailing for several weeks past, makers are discouraging the booking of tonnages for delivery during the first quarter of next year. They are turning down more business than they are booking. With improved traffic conditions November will be a record-breaking month insofar as shipments are concerned, with many of the cold-drawn mills in this section. Recent individual orders have involved fairly large tonnages, one in particular calling for 1000 tons of large bessemer steel rounds. Makers claim that with merchant steel bars at 2.00c, a $15 conversion charge should place the cold-drawn market upon a basis of 2.75c, minimum. That price only has been secured in isolated cases and the going market remains unchanged at 2.50c, base Pittsburgh.

Bolt, Nut, Rivet Orders Are in Fair Volume

NUT AND BOLT PRICES, PAGE 1158

Pittsburgh, Oct. 24.—While a number of nut, bolt and rivet machines in various plants in this district still are inactive, operations gradually are improving with the bettering traffic conditions. Recently a large demand for bolts from coal mining operations has developed. Other consuming lines have come into the market for fair sized lots although jobbers have not figured largely in buying since Oct. 1. Heavy orders were placed by them during the last quarter at lower figures than those now prevailing. Deliveries are better than has been possible for two or three weeks past. Structural rivets are quoted all the way from 3.00c to 3.25c and boiler rivets from 3.10c to 3.35c, base Pittsburgh, although those quoting the maximum figures are not doing much business, even those quoting 3.15c and 3.25c, respectively, receiving limited orders.

Bolt Situation Satisfactory

Chicago, Oct. 24.—With excellent order books for fourth quarter delivery and a satisfactory volume of current buying for immediate needs, manufacturers of bolts and nuts find the remainder of this year offering excellent business. The present schedule of prices is being maintained and shading is not being done.

Demand Is Satisfactory

Cleveland, Oct. 24.—Makers of bolts and nuts in this district are satisfied with the amount of business being placed. One large maker reports that its orders placed during the first 20 days of this month were equal to those placed during the same period in September. This was somewhat surprising as a small drop in orders was expected. Prices are being maintained and shop operations steadily increased.

As with bolt and nut producers, rivet makers report satisfactory demand. While most of the business in rivets is on old contracts made at the former prices some new business is being placed at the higher levels. However, it is understood the new business is rather light. The leading rivet maker here now is receiving larger steel supplies and has increased its operations to 100 per cent of capacity.

Hoop Needs Are Covered

HOOP PRICES, PAGE 1096

Pittsburgh, Oct. 24.—Present hoop and band business consists mainly of 50 to 200-ton lots, depending upon the size of the consumer. Most users have been fairly active in placing orders so that mills are well committed to the end of the year. Some of this tonnage probably will have to be carried over into next year but every effort will be made to discharge obligations within the next 60

or 70 days. Prices range from 2.90c to 3.25c, the 3.50c figure having entirely disappeared. From 3.00c to 3.25c is quoted on narrow sizes and thin gages but 2.90c is considered the regular market figure.

Demand Is Steady

Buffalo, Oct. 24.—The 2.75c base Pittsburgh price on hoops and bands has disappeared and the new minimum is 2.90c, Pittsburgh. Demand is steady and in considerable volume.

Exceptions To Be Filed in Ore Rate Case

ORE PRICES, PAGE 1158

Cleveland, Oct. 24.—The rate committee of the Lake Superior Iron Ore association and legal representatives of the shippers will meet in Cleveland, Monday, Oct. 30, to consider the recommendation made by the examiner for the interstate commerce commission in the case involving the upper lake ore rates. The shippers are disappointed with that part of the examiner's report which upholds the Minnesota rates, and will file a bill of exceptions. A hearing on the report will be held before the full commission some time in December, and a final decision probably will be made a few weeks later. It is hoped that the rate situation will be definitely cleared up by the beginning of the next shipping season. A complete report of the examiner's findings in the case will be found elsewhere in this issue of IRON TRADE REVIEW.

Some of the shippers continue to make sales of small tonnages of ores for filling in purposes, but the market otherwise is inactive.

Iron Ore Tax Case To Be Heard Dec. 4

Duluth, Minn., Oct. 24.—The Minnesota occupation tax case will be heard by the United States Supreme Court Dec. 4. It is expected last year's tax will be payable next January should the state's claim be upheld. The tax is estimated to net the state $5,000,000 annually in normal years. Last year's aggregate will not be more than $1,500,000, on account of the depression.

The largest operations in years on the Lake Superior ranges is foreshadowed for 1923 by the Oliver Iron Mining Co., and independents. The Shenango Furnace Co. is to work double shifts at the Shenango and Webb mines after Nov. 1.

Fluorspar Is Advanced

Pittsburgh, Oct. 24.—Illinois fluorspar was advanced late last week $4 per ton, and the 85 and 5 per cent grade now is quoted at $21.50, f.o.b. mines, instead of $17.50. Not much new demand is noted although several consumers have bought during the past several weeks. Additional requirements are expected to come out shortly from those consumers who have not covered upon their full winter's supply. Sellers of Kentucky fluorspar are naming the same figure, f.o.b. Kentucky mines.

Plate Market Is Quieter

Prices on Prompt Material Generally Easier—New Lake Vessel Construction Work Developing—Some Car and Tank Contracts Let

PLATE PRICES, PAGE 1096

Philadelphia, Oct. 24.—Plate demand is small and there is considerable competition for the business offered. Prices range between 2.00c to 2.25c, Pittsburgh for prompt shipment. Although general demand is smaller, there are several outstanding developments. It is understood that two Red D boats, long held in abeyance, finally have been awarded to the New York Shipbuilding Corp., and there is a well defined rumor that the Pennsylvania railroad will build 45 more locomotives at Altoona, requiring 1350 tons of plates. The Cruse-Kemper Co. has placed 2500 tons of plates for gas holders for Conshohocken, and the Reading railroad has placed 900 tons. The Pennsylvania railroad recently placed about 2500 tons of plates for delivery this year but has taken no action as yet for the first quarter. The Chesapeake & Ohio is about to close for a large tonnage. The Norfolk & Western and Baltimore & Ohio are expected to close for their requirements. The J. G. Brill Co. is expected to buy steel for 200 cars for the Philadelphia Rapid Transit railway. The railway is expected to place 200 passenger cars with the Brill company. The Pennsylvania railroad may place 45 additional locomotives with its own shops.

Negotiations Fall Off

Pittsburgh, Oct. 24.—Negotiations for tonnages of sheared plates for tank construction have fallen off considerably this week as compared with last. It is reported here that all the 15 tanks wanted by the Sinclair interests were placed with the Chicago Bridge & Iron Co. This involves between 3000 and 4000 tons of plates, depending upon whether 55,000 or 80,000-barrel tanks were decided upon. A similar tonnage is understood to be involved in the recent order of the Champion Refining Co., Enid, Okla., placed with the Pennsylvania Tank Car Co., Sharon, Pa. While tonnages of this size develop lower figures than 2.25c, this represents the going market on the smaller lots involved in the general run of business. Some orders involving up to 200 tons at a time have been placed this past week at the 2.25c figure. Plates, therefore, continue to be quoted at 2.00c to 2.25c, base Pittsburgh. Mine car builders continue to order in small lots and various other consuming lines such as boiler manufacturers, barge builders, etc., continue to come into the market.

Negotiating for Tank Work

Chicago, Oct. 24.—Considerable inquiry from builders of oil storage tanks has been received recently by platemakers. Plates are difficult to obtain for early delivery and inquiries are being made for as much tonnage for nearby delivery as the mill can furnish. Tank builders are finding it difficult to obtain sufficient material for the prospective business now under consideration. Heavy tonnages of plates are being called for by car builders and delivery to this class of users is much behind. Plates are quoted at 2.10c, Chicago, by the leading producers and at 2.30c, Chicago, for fourth quarter delivery by Inland Steel Co. The latter has only a limited tonnage for the present year.

Receiving Former Inquiries

New York, Oct. 24.—Indications are that some important oil storage tank business on which bids recently were received and on which action was postponed, will come up again shortly, because the oil companies believe they now can buy the tanks at lower prices. The Sinclair interests have an inquiry out for ten 80,000-barrel tanks, involving 3000 tons of plates. It is believed that this business will not be closed immediately. The Standard Oil Co. of New Jersey is placing some plate tonnage right along, mainly for stills. Considerable tonnage for locomotives also has been placed by the American Locomotive Co. The United States Steel Products Co. has booked some plate business for Japan. Some export plate business has been received from South America, the main tonnage involving requirements of the Chilean state railways. Plate prices reflect considerable variation. Some tonnage continues to be placed at 2.25c, base Pittsburgh. Desirable lots of sheared plates, not involving more than one or two cars each, have gone as low as 1.95c, base Pittsburgh. The average price on attractive tonnages appears to be 2.00c Pittsburgh.

Lake Ship Work Pending

Cleveland, Oct. 24.—Considerable miscellaneous new vessel construction is before lake yards. Inquiries are out for two freighters of a special unloading type which will require about 2000 tons each. The Collingwood Shipbuilding Co., Collingwood, Ont., will build on its own account a 3000-ton boat of Welland canal size which will call for about 1000 tons of steel. Six power barges involving several thousand tons are pending. The plate market is quieter and has an easier tone. One large independent mill has been offering plates in this territory for from 4 to 6 weeks' delivery at 2.00c Pittsburgh. For more distant delivery down to 1.90c Pittsburgh is understood to be named by the Steel corporation where business is desirable. Some of the 1500 to 2000 tons of oil stills which has been in the market was closed the past week.

Offer Last of Surplus

Washington, Oct. 24.—About 50 tons of brass valves and 150 tons of iron valves, many of them brass fitted, will be included in the surplus material at the Sparrows Point, Md., yard of the Bethlehem Shipbuilding Corp., to be auctioned by the Emergency Fleet corporation on Nov. 22. Four oil-burning boilers also will be sold. This will be the last of the Fleet corporation's auction sales of surplus materials.

Scrap Prices Go Lower

Further Revision in Quotations Reduces All Levels an Average of 50 Cents—30,000 Tons Sold at St. Louis and 25,000 at Pittsburgh

SCRAP PRICES, PAGE 1162

Chicago, Oct. 24.—Lack of cars and small volume of new scrap coming onto the market has slowed the trade materially. Need of scrap by consumers has not lessened, as is indicated by pressing requests on dealers for more rapid deliveries. Steel grades, malleable and cast scrap are most in demand, in small lots for current use. There is no speculation in the present market and sales are for immediate use. High prices are being paid railroads for their offerings, but comparatively little is coming out from this source. Accumulations in scrap yards have been fairly well cleaned up recently and small receipts from country dealers are a result of the car situation.

Demand Falls Off

Boston, Oct. 24.—The urgent demand for scrap has entirely disappeared from the market and prices of several grades are softer. Stove plate holds firm at $17 as the result of a round tonnage inquiry within the last few days, but heavy melting steel is off 50 cents, and practically all of the cast grades are obtainable at prices slightly lower than prevailed a week ago. Railroad malleable, which sold at $21 about the middle of the month, is now selling at $19.50, delivered to consumers. Chemical borings are in fair demand at $17. No. 1 machinery has sold at $22, but the total tonnage moved is almost negligible. Dealers are confident of a return to stronger prices, and are buying for speculation. The Watertown arsenal is offering 2000 tons of miscellaneous scrap.

Some Grades Off

New York, Oct. 24.—Quotations of heavy melting steel and No. 1 railroad steel are off 50 cents, now being quoted at $13.50 to $14 and $14.25 to $14.75, New York, respectively. At present, virtually the only buyers of this material are the Bethlehem Steel Co. and the Alan Wood Iron & Steel Co. Mixed borings and turnings and machine shop turnings, however, have advanced about 50 cents, holding at $12.25 to $12.75, New York. Other grades are unchanged. The market generally is rather quiet, with wrought pipe, borings and turnings and cast scrap possibly in principal demand at the moment.

Prices Are Easier

Philadelphia, Oct. 24.—Despite comparatively heavy scrap business in the past week, prices continue easier. This is because of the railroad congestion which has been keeping the local scrap in this district. Furthermore the lower price tendency is bringing out considerable scrap which is further depressing the market. The leading buying in the past week was by the American Bridge Co.'s Pencoyd works which bought fully 15,000 tons, mainly cast, and paid $23, delivered. Heavy breakable cast since has been bought at $21 and is now offering at $20.50. The Bethlehem Steel Co. reduced heavy steel 50 cents and bought a large tonnage. There is good buying of miscellaneous items with prices showing a downward tendency.

Taking Only Needs

Buffalo, Oct. 24.—Convinced that the scrap market is showing signs of softening, steel plants are buying only for their immediate needs. Some limited heavy melting tonnage is being sold at $19.50 to $20.50, but dealers having little stock on hand, are reluctant to take orders at those figures and run the risk of selling short. Mills believe the continuance of the present embargoes will soften the local market still further, but dealers claim the market will stiffen as soon as shipments of heavy melting taken at as high as $23 can be sent through to Youngstown. Malleable is up to $22 to $23 and cast scrap is strongly in demand, particularly in Canada. Railroad scrap is slow coming out and transportation facilities are at a premium.

Dealer Trading Active

Pittsburgh, Oct. 24.—Activity in the scrap market still is largely confined to dealers which now are offering heavy melting steel among themselves at $21 to $21.50, or 50 cents below the price prevailing one week ago. Most con-

(Concluded on Page 1109)

Sheet Bar Sales Heavy

40,000 to 50,000 Tons Placed by Large Interest with Four Makers—Some Slabs Included—20,000 Tons Figure Above $40, Youngstown

SEMIFINISHED STEEL PRICES, PAGE 1096

Pittsburgh, Oct. 24.—Sheet bar purchases by an interest which ordinarily is not a factor in the open market is the principal feature in the semifinished steel trade. These purchases in four or five directions are esimated to aggregate 40,000 to 50,000 tons, two involving 5500 tons and 10,000 to 15,000 tons, respectively, going to Mahoning valley interests, another of approximately 15,000 tons to an eastern Pennsylvania interest, and a fourth of about 20 000 tons to a Kentucky producer. While the last is understood to have been consummated at about $38, mill, or above $40, Youngstown, the $40 mill level was departed from only in one case where $39.50 was paid.

Rerolling billets and slabs continue to be quoted at a minimum of $40, mill. It is claimed that the absence of inquiries for billets and slabs is due to the fact that conversion mills cannot buy and convert the steel profitably on the $40 basis. The only inquiry of interest is one for 5000 tons of 4 x 4-inch rerolling billets. This is understood to originate in the Pittsburgh territory but is being circulated by a valley scrap interest. Demand for forging billets appears to have been satisfied for the time being, no active inquiries now being before the trade, and no orders being reported placed in the past week. The last sales were on the basis of $45 to $50, Pittsburgh.

A large amount of wire rod business is current but most mills need the rods in their own finishing departments. One inquiry late last week involved 1000 tons. On recent sales by independents $47.50 to $50, Pittsburgh, have been the levels obtained although it is understood that buyers were willing to pay these prices during the period of stress when deliveries on their $45 contracts were held up. Conditions are improving somewhat in this regard so that it now will be increasingly difficult to obtain higher than $45 to $47.50. Skelp continues quotable at 2.00c to 2.25c, base Pittsburgh, with specifications on contracts being freely furnished, although new demand is light.

Rod Tonnages Placed

New York, Oct. 24.—Wire rod demand continues active. It now is more difficult to buy rods at less than $47.50, base Pittsburgh. Several rod tonnages, both basic and acid, have been placed in the past few days at this base. Billet demand is small. A few moderate sized lots of open-hearth rerolling billets have been placed at $41 and $42, base Pittsburgh. Some business in forging billets has been placed at $47 and $47.50, base Pittsburgh.

Places Slab Tonnage

Youngstown, O., Oct. 24.—A large user of semifinished material recently purchased a round tonnage of sheet bars from a valley producer at $40, Youngstown, for early shipment. The consumer also has placed considerable tonnage of slabs and sheet bars with a southern producer. Little semifinished material is available here on account of intermill and customers' requirements. Sheet bars, billets and slabs are quotable at $40, Youngstown. Few inquiries are current.

Forging Billets Higher

Philadelphia, Oct. 24.—A considerable tonnage of rerolling billets was sold in the week at $40, Pittsburgh. Forging billets are higher and the price of $45 is tending to disappear.

Warehouse Demand Strong but Stocks Are Low

WAREHOUSE PRICES, PAGE 1154

Cleveland, Oct. 24.—Delivery problems continue to perplex warehouse interests in this district. Jobbers report demand continues extremely heavy but due to depleted stocks, many orders are being turned away. A jobber in sheets reports he has had considerable difficulty in getting deliveries from mill of copper sheets. However, this situation has been relieved somewhat by the utilization of trucks. Prices are firm at the established levels.

Stocks Are Fair

New York, Oct. 24.—Steadiness marks the local warehouse market,

prices holding unchanged. At the same time, demand is of an even character. While some jobbers are in urgent need of some material and are therefore forced to buy from other jobbers in an effort to meet demands of old customers, the majority of warehouse interests announce their stocks are still in fair shape.

Demand Falls Off

Philadelphia, Oct. 24.—Jobbers in iron and steel products in this district report a falling off in demand. However, prices generally are unchanged although some shading is reported.

Prices Are Revised

Detroit, Oct. 24.—Jobbers in iron and steel products in this district have issued a new card of prices. Iron and steel bars now are quoted 3.00c; plates and shapes 3.10c, bands, 3.80c, hoops, 4.20c and cold-rolled shapes, 4.30c. These new prices are an advance of $2 a ton over those formerly quoted.

Tin Plate Orders

Declined by Makers Because of Heavy Obligations—Production Costs Soar

TIN PLATE PRICES, PAGE 1096

Pittsburgh, Oct. 24.—Tin plate producers continue to refuse offered business since to accept it would only add to the tonnage already accumulated. Occasionally new orders are accepted when they fit in with present rollings, but mill operations largely are maintained upon the specifications being furnished regularly on old orders. Production costs continue to advance and producers declare September costs went up to a point entirely out of proportion to the $4.75 per base box, Pittsburgh, selling price. In fact, every item entering into the operation of a sheet or tin mill shows an increased cost in September over August. October is maintaining these higher production cost levels so that it is almost a foregone conclusion the next price announcement in connection with tin plate will show an advance. Not only have the mills of the American Sheet & Tin Plate Co. had their operations interfered with by poor deliveries of tin bars, but the mills of independent producers likewise have had to curtail output.

Large Inquiry Comes Out

New York, Oct. 24.—The biggest tin plate inquiry appearing here for some time has been put out by the Standard Oil Co. of New Jersey. This interest is taking prices on 150,000 boxes. As the tin plate is to go to the company's plant at Bayonne where it will be utilized in putting up oil in packages for shipment abroad, it is considered export business. Heretofore makers generally have quoted on this business with consideration for the drawback in the duty on foreign tin plate. Present views of the tin plate market are such, however, that the makers are not expected to make any draw back concession at this time. In fact, producers say the present $4.75, base Pittsburgh, price on tin plate is low, and there is talk of an advance Nov. 1. In the meantime, stock-list tin plate continues to sell at prices ranging from $4.35 to $4.60, Pittsburgh, depending on the grade.

Sheet Inquiry Is Lighter

Slightly Less Activity Noted in Valley, Though Buyers Are Still Insistent on Deliveries—First Quarter Prices To Be Named Soon

SHEET PRICES, PAGE 1096

Pittsburgh, Oct. 24.—Sheet purchasers are growing more insistent, as regards delivery of material already on makers' books and also in booking further orders. While some have been successful in having their estimated requirements for a part or all of the first quarter of next year accepted at prices to be announced later, this practice is rather discouraged by makers since it now appears that tonnages will have to be allotted for that period. The trade expects that the American Sheet & Tin Plate Co. as well as independents will not be able to defer much longer the announcement of prices for the first quarter, and these probably will come out early in November. Specifications on contracts are heavy and new business offered is large and for practically all grades of sheets. Black and galvanized are particularly needed and electrical sheets as well as full-finished automobile sheets also continue in good demand. The chief deterrent upon sheet mill operation at present is the shortage of steel and lack of transportation facilities. Even if these were normal, however, operations could not exceed 85 per cent because of a shortage of labor. Steel supplies have improved but slightly since a week ago, and the betterment as regards the car supply is just perceptible. The American Sheet & Tin Plate Co. reports that its hot mill operation this week is slightly in excess of that of last week, its expected improvement in this direction being but partially realized. Various expedients have been resorted to to bring about increased steel supplies and to permit of better delivery service. This has served largely to increase operating expense, although in connection with deliveries the higher cost is borne by the consumer. While the American company's price of 2.50c, 3.35c, 4.35c and 4.70c, base Pittsburgh, respectively, for blue annealed, black, galvanized and full-finished automobile sheets are nominal, they have been met by independents in a few instances. The actual market levels on these grades are 2.60c, 3.50c, 4.50c and 4.85c, base Pittsburgh, respectively. As against these levels, as high as 2.85c, 3.85c, 4.85c and 5.00c, respectively have been quoted and in some cases received by independent makers in or near the Pittsburgh territory.

Less Inquiry Noted

Youngstown, O., Oct. 24.—Inquiry for sheets has tapered off somewhat and the market generally is reported quiet. Makers have several weeks rolling ahead although orders for black in warming up sizes would not be rejected. Galvanized constitutes the bulk of the going business and most producers are well booked. In scheduling their mills on galvanized specifications a few makers have accumulated considerable tonnage of black and in the absence of demand are reported to be offering tonnages at 3.35c, base Pittsburgh. The independent market here generally is quotable at 3.50c for black and 4.50c, base Pittsburgh, for galvanized. A mill in the lake district is offering galvanized in this district at 4.40c, base Pittsburgh. Automobile sheets are firm at 5.00c, base Pittsburgh, producers in this territory being sold ahead until the first quarter of 1923. Indications are that considerable tonnage now on the books will be carried over to next year. Consumers of this grade of sheets expect to be busy over the balance of this quarter and have their requirements covered accordingly. A large user of fine finished sheets in the Detroit district is canvassing mills in this and the Canton, O., territory for certain grades of automobile sheets, but as far as can be learned has not met with much success in lining up tonnage for delivery this quarter.

Premiums for Prompt Delivery

Chicago, Oct. 24.—Because of the sold-up condition of both sheet mills at Chicago, consumers who are not receiving sufficient shipments on their contracts are unable to book additional tonnages with the local producers for delivery this year. They are able to obtain some sheets from mills further east, but material for prompt delivery is to be had only at premiums ranging up to $5 over the minimum schedule. On this basis they are able to place orders for December delivery. Neither Chicago producer has yet opened books for first quarter. The present nominal schedule is 2.50c for blue annealed, 3.35c for black and 4.35c, Pittsburgh, for galvanized.

Current Demand Slower

Philadelphia, Oct. 24.—Current sheet demand is considerably slower than a few weeks ago but the mills expect improvement soon as many consumers have not covered their November and December requirements. Prices are unchanged. Most of the blue annealed tonnage is going at 2.75c, Pittsburgh, though 2.60c is still being done. Black sheets generally are going at 3.50c and galvanized at 4.50c, although some black and galvanized sheets are being sold at higher figures.

New Strip Orders Fair

STRIP PRICES, PAGE 1096

Pittsburgh, Oct. 24.—Prices quoted for several weeks past on strip steel, namely 2.90c, base Pittsburgh, on hot-rolled and 4.50c on cold-rolled, are absolute minimums and a large amount of business has been closed at those figures. Makers have not as yet opened books for the first quarter of next year. It is possible some tonnage now on the books will be carried forward to that period since adverse traffic conditions have interfered with deliveries. Steel still is short but embargo modifications are helping deliveries somewhat. New business of fair proportions is coming in from various consuming lines. On certain sizes of hot-rolled 3.00c and 3.25c is quoted but 2.90c is the general market price.

More Structurals Placed

Awards Reach 17,697 Tons in Week—Metropolitan District Buildings in Eight Months Take 290,000 Tons—Eastern Demand Now Lower

STRUCTURAL SHAPE PRICES, PAGE 1096

New York, Oct. 24.—Contrary to the order of the preceding week, new inquiry in the local structural market has exceeded buying. New inquiries are coming out in surprising volume for the season and for the moment at least orders are rather small and scattered. One of the larger new projects up for the near future calls for 2000 to 3000 tons for a Masonic temple in this city. An office building and theater in Forty-third street, involves a still larger tonnage. An interesting development is the placing of 10,000 tons of bridgework for the East Indian railway. American fabricators lost this job to a British company which underbid the lowest of them, it is said, by about $10 a ton. Large domestic orders reported in this district involve 5000 tons for an industrial building for the Ford Motor Co., Detroit, and 2500 tons for bridgework for the Baltimore & Ohio railroad. The Bethlehem Steel Bridge Corp. is low bidder on 3400 tons for an addition to the 148th street repair works, this city, of the transit commission.

Prices continue at 2.00c to 2.10c, Pittsburgh, on shapes for delivery in about eight weeks, and at approximately 2.20c on material for earlier shipment. Fabricated material is also virtually unchanged as to price.

Figures just available show 290,000 tons of structural steel awarded in the Metropolitan district for building work only in the past eight months. This is exclusive of bridges, piers, subways, etc.

Attending to Deliveries

Pittsburgh, Oct. 24.—Structural shape makers are confining most of their efforts to delivery of steel rather than adding to their commitments. While the railroad situation has improved somewhat with the further modification of the Pennsylvania railroad's embargo to permit shipments to all points except those in the Great Northern division, the car supply still is far from normal. Deliveries still are being made by truck and other conveyances. Awards are few and projects coming up are not numerous although local fabricators report that on the few that are up competition is particularly keen from eastern Pennsylvania steel producers. Several local building propositions are in the formative stage, including several school buildings and a large building on the North Side for the Ward Baking Co., upon which alternative structural and concrete bar propositions will be considered. Prices still range from 2.00c to 2.25c, base Pittsburgh.

New England Awards Decline

Boston, Oct. 24.—The past week has seen a rather marked decline in awards for building construction requiring structural steel. Except for a 2000-ton contract for an office building in Boston, practically nothing over 100 tons is announced. Prices of structural shapes hold firm at 2.10c to 2.25c, Pittsburgh, but slight softness is apparent in recent erected prices. A fairly large tonnage for the average office building will command $90 erected. A recent contract for 200 tons was placed at $80 fabricated and delivered.

Are Well Booked Up

St. Louis, Oct. 23.—Fabricators of structural steel report a decline in the demand but sufficient orders booked to keep them busy until the end of the year. A revival in ordering is expected early in January, when it is thought conditions generally in the building indusctry will be more favorable.

Lull in Structural Buying

Chicago, Oct. 24.—Considerably less activity is evident in the structural market and lettings in western territory are much under the former rate. During the past week only two tonnages have been placed with fabricators. The American Steel & Wire Co. has abandoned steel for its warehouse at Denver, Colo., which would have required 587 tons, and has substituted timber construction. No change has taken place in the quotation on plain material, which remains 2.10c, Chicago, on the part of the leading producer and 2.20c, Chicago, the nominal quotation by Inland Steel Co.

Shipments Gain on Orders

Philadelphia, Oct. 24.—The demand for structural shapes in this district generally is quiet. Main inquiry is restricted to fabricators. The current market is 2.00c to 2.15c Pittsburgh. The latter is for spot sales. It is estimated demand has dropped off 10 to 15 per cent in the past week, so the mills now are not replacing shipments.

Await Contracts Pending

Cleveland, Oct. 24.—Interest in structural shapes is confined largely to the pending awards of tonnages involved in the Collinwood school, the Halle Bros. Co. addition, the Tifereth Israel temple and other sizable projects, nearly all of which require 1000 tons or more. Action on some of them is expected this week. Recent awards have been small, a power house at Lorain, O., involving 150 tons, being typical. One mill has promised delivery in four to six weeks at 2.00c, Pittsburgh.

CONTRACTS PLACED

Awards reported this week ..... 17,697 tons
Awards reported last week ..... 10,315 tons
Awards reported two weeks ago .. 44,060 tons

2500 tons, miscellaneous Baltimore & Ohio bridges, to McClintic-Marshall Co.
2000 tons, office building, Boston, to New England Structural Co.
2000 tons, power house, Williamsport, Md., to Bethlehem Steel Bridge Co.
1650 tons, Dexter Horton office building, Seattle, to Puget Sound Bridge & Dredging Co.
5000 tons, industrial building for Ford Motor Co., Detroit, to American Bridge Co.
875 tons, apartments for Metropolitan Life Insurance Co., New York, to local fabricator.
700 tons, plant in Birmingham, Ala., for Phoenix Portland Cement Co., placed with unidentified fabricator.
550 tons, apartment, Seventy-third street and Lexington avenue, New York, to A. E. Norton, Inc.
450 tons, Freedman apartments, Forty-seventh street and Lexington avenue, New York, to A. E. Norton, Inc.
350 tons, school building for St. Mark's congregation, Duck Creek boulevard, Cincinnati, to L. Schrieber Sons Co.
300 tons, school, Rockville Center, Long Island, to National Bridge Co.
300 tons, substation for New York Edison Co., New York, to Hay Foundry & Iron Works.
250 tons, warehouse of National Biscuit Co., Reading road, Cincinnati, to General Iron Works Co.
227 tons, warehouse for Patterson & Sargent Co. at Chicago, to T. H. Brooks Co., Cleveland.
175 tons for College of Pharmacy, West Sixty-eighth street, New York, to Charles Fox.
150 tons, power house, Ohio Public Service Co., Lorain, O., to American Bridge Co.
122 tons, high school building, Cedar Rapids, Iowa, to Rock Island Bridge & Iron Co.
100 tons, fertilizer storage shed for M. L. Shoemaker, Philadelphia district, to Morris, Wheeler & Co.

CONTRACTS PENDING

4000 tons, National Biscuit Co. building, Philadelphia, bids close Oct. 28.
3400 tons for addition to 148th street shops of transit commission, New York; Bethlehem Steel Bridge Corp., low bidder.
2500 tons for power plant in Indiana; Stone & Webster, Boston, engineers in charge.
2000 to 3000 tons, Mecca Masonic temple, Broadway, between Fifty-fifth and Fifty-sixth streets, New York, bids to be asked this week.
2000 to 3000 tons, theater in Forty-third street, New York; Russell B. Smith, 452 Fifth avenue, New York, engineer; specifications to be issued soon.
1500 tons, New York *Times* annex, West Forty-third street, New York; George A. Fuller general contractor.
1500 tons, Soloman Masonic temple, Newark, N. J., bids asked.
1000 tons, addition to Tuller hotel, Detroit, general contract to VanBlarcom Co., Cleveland.
800 to 900 tons, apartment, for J. Axelrod & Son, West Seventy-first street, New York; specifications to be issued shortly.
600 tons, school and assembly hall for St. Mary's congregation, Cincinnati, Howard W. German, Dayton, O., architect, bids to be taken soon.
500 tons, transit shed, Los Angeles, harbor commission to open bids Nov. 3.
475 tons, transit shed, Los Angeles, harbor commission to open bids Oct. 27.
400 tons, theater for Lincoln Theater Co., Cincinnati, Frank W. Folz & Co., general contractors.
400 tons, high school, Carrick, Pittsburgh, bids close Nov. 4.
400 tons, for Corn Products Co., Argo, Ill., bids in.
395 tons, for Chicago Mill & Lumber Co., Chicago, bids in.
350 tons, freight depot for Gulf, Colorado & Santa Fe railroad, Dallas, Tex., bids in.
300 tons, apartment for James A. Mears Co., East Sixty-first street, New York, pending.
300 tons, apartment, West Eleventh street, for Wacht Construction Co., New York, bids asked.
200 tons, men's gymnasium, Ohio university, Athens, O., general contract to E. H. Latham Co., Columbus, O.
150 tons, town hall, Gardiner, Mass., bids in.
Tonnage not stated, foundry for Bartlett-Hayward Co., Baltimore, bids asked.

Coal Conveyor Contracts Still Pending

Contracts for the coal conveying system which is to be installed at the Colonial dock of the H. C. Frick Coke Co. in the Brownsville, Pa., district still are pending but action is expected to be taken by the company momentarily. Considerable interest has been attracted to the installation on account of its expensiveness. According to present plans two trains of 34 cars each will be pulled onto a pair of car dumpers which will be arranged parallel and operated by compressed air. The dumpers will be designed to roll over the 68 cars of coal simultaneously, the fuel falling into a series of hoppers. Thirty-four apron feeders will be provided at

the bottom of the hoppers by which the coal will be fed onto a conveyor belt 5 feet wide and 350 feet long which in turn will discharge the product onto a 4-foot belt conveyor. The latter, which will be built in 20 sections, will operate at 450 feet per minute and will handle 1220 tons of coal per hour. It will convey the coal underground to bins to be built on the banks of the Monongahela river, a distance of approximately 5 miles, to be discharged later into barges. During the 5-mile transit, the conveyor will make several turns, one of which will be at an angle of 45 degrees. The operating equipment, according to estimates, will cost approximately $500,000. This conveyor system is one of four which will be installed by the H. C. Frick Coke Co.

Wire Consumers

Are Pressing Mills for Larger Shipments—New Inquiry Is Lighter

WIRE PRICES, PAGE 1096

Chicago, Oct. 24.—Delivery of wire and nails now is the important factor in this market and jobbers uniformly are pressing mills for larger shipments. This indicates the need on the part of consumers and also that jobbers' warehouses are devoid of stocks. The situation is that users can obtain material only as fast as mills turn it out, as there are no reserves on which to draw. At the same time, inquiry for new business is somewhat quieter, doubtless due to the fact deliveries have been delayed. Production is about 50 per cent of capacity, and no likelihood of increasing this rate is seen. Prices remain steady at 2.45c, Pittsburgh, for wire and 2.70c, Pittsburgh, for nails. No shading is being met.

Indifferent to Further Bookings

Pittsburgh, Oct. 24.—Wire products continue to be shipped in open top cars due to the car shortage. In some cases, practically 50 per cent of the cars used are of the open top type. A diversified demand of fairly sizable proportions continues and makers are reaching the stage where they are indifferent to the booking of additional business since their potential output for the remainder of the year largely is obligated. Some have withdrawn salesmen from the road, and from now on bookings will be confined to unsolicited business. The agricultural demand is more or less diversified due to the low prices farmers are receiving for their products. Occasionally fencing business is booked on spring terms. Prices are unchanged with plain wire quoted at 2.45c and wire nails at 2.70c, base Pittsburgh, with other products priced accordingly. The Cambria Steel Co., however, continues to quote 2.50c and 2.75c, respectively.

Embargoes Hamper Shipments

New York, Oct. 24.—Some wiremakers again are falling back in their deliveries owing to the extent to which railroad embargoes are hampering shipments. As a result, some consumers here again have been having difficulty in maintaining operations. Prices on wire continue unchanged at 2.45c, base Pittsburgh, and none of the independents now are asking higher. Nails are quoted generally at 2.70c, base Pittsburgh.

16,500 Freight Cars Pending

Railroads Continue To Inquire for Rolling Stock, 10,990 Units Appearing This Week—More Than 2000 in Sales Reported

RAILROAD TRACK MATERIAL PRICES, PAGE 1096

New York, Oct. 24.—A total of 16,500 freight cars now is before the market. A feature is the continued good inquiry for locomotives, more than 150 being brought out recently. Of this number 59 are for the Northern Pacific, 50 for the Chicago, Milwaukee & St. Paul, and 20 for the Grand Trunk, the latter being switch engines. Other inquiries call for 10 for the Rio Grande, five for the Western Pacific and three for the Toledo Terminal.

The Chilean state railways are buying considerable quantities of axles, plate bars, spikes and other replacement and repair materials.

More Cars Are Sought

Chicago, Oct. 24.—With inquiry for 10,990 freight cars of various types coming into the market, this department promises great activity, as some of the present inquiry probably will be placed with builders during the present week. Builders are handicapped in making deliveries of finished cars by slow shipment of steel from mills. In spite of the best efforts of producers and vigilance on the part of builders it is not possible to obtain sufficient steel to keep shops at capacity operation. It is understood the Chicago, Milwaukee & St. Paul is in the market for 100 locomotives. Since the rush of general buying of steel rails just prior to Oct. 1 this department has been dull. Recently some small lots of standard steel rails involving 200 to 300 tons have been closed at the new price of $43, mill. This business is of minor importance. Steel axles are somewhat irregular in price and are being quoted at 2.60 to 2.80c, mill, by various producers.

Behind on Deliveries

Pittsburgh, Oct. 24.—Light rails continue to be sold by the mills in fair sized lots at 2.25c due to the extension of coal mining activity. On deliveries of this commodity the Carnegie Steel Co. is from 10 to 12 weeks behind and new bookings consequently are somewhat limited. Independent makers also have large order books but several are able to offer better deliveries. The going market on billet rails remains unchanged at 2.25c although the rerollers are quoting from 2.00c to 2.15c, base Pittsburgh.

Track accessories appear to be somewhat weak, large lots of tie plates having brought 2.25c recently. The 2.50c figure recently named has largely been supplanted by 2.35c which now represents the top of the market. Standard railroad spikes are being sold at a minimum of 2.75c, however, and 3.00c likewise is being quoted on small lots. Recent orders have not been large. Small spikes continue to be sold in fair sized quantities at 3.00c to 3.50c. Track bolts are firm at a minimum of 3.85c although up to 4.50c still is quoted.

The New York, New Haven & Hartford has placed an order for the construction of eight locomotives with the Westinghouse Electric & Mfg. Co., East Pittsburgh. The Pennsylvania also has placed an order with the same company for the electrical equipment of three locomotives.

CAR ORDERS PLACED

Tennessee Coal Iron & Railroad Co., 195 miscellaneous cars, to Chickasaw Ship Building Co.
Western Pacific, 100 automobile cars, to Mt. Vernon Car Mfg. Co.
Detroit, Toledo & Ironton, 500 coal to Cambria Steel Co. and 500 coal to Standard Steel Car Co.
New York Central, 500 box car repairs, to Streator Car Co.
Erie, 500 gondola repairs, to Magor Car Co.
Pennsylvania Coal & Coke Corp., 1000 hoppers, to American Car & Foundry Co.

CAR ORDERS PENDING

Pere Marquette, 1000 box and 500 hoppers, bids asked.
Chicago, Milwaukee & St. Paul, 2000 box, 3000 gondolas and 100 freight, bids asked.
American Short Line, 200 stock cars and 50 gondolas, bids asked.
Hocking Valley, 1000 repairs, bids asked.
Louisville & Nashville, 2000 hoppers and 1000 steel underframe box, bids asked.
Texas Co., 100 tank cars, bids asked.
National Refining Corp., Hoboken, 40 tank cars, pending.
Virginian, 1000 gondolas, bids asked.
Long Island, 92 miscellaneous coaches, pending.
Central of New Jersey, 30 coaches to Standard Steel Car Co. and 35 to American Car & Foundry Co.

War Office Asks Survey of Available Minerals

Secretary of War Weeks has asked Arthur S. Dwight, president of the American Institute of Mining and Metallurgical Engineers to supply him with a statement concerning the country's resources of certain strategic minerals and their availability in the event of war. This inquiry has been referred to a general committee on industrial preparedness, which has united with the committee on foreign and domestic mining policy of the Mining and Metallurgical Society of America in appointing joint committees.

The subject of manganese has been referred to a sub-committee of which C. M. Weld, 2 Rector street, New York, is chairman and D. F. Hewett, Bradley Stoughton and John A. Mathews are members.

The value of the results of this investigation will necessarily depend upon the quantity, accuracy and degree of detail of the data that can be obtained, it is pointed out. It is desired to make use of every available source of information. Many manganese deposits throughout the country have been examined by engineers and geologists since 1917 and many reports have been printed. Many additional reports are believed to be in the hands of engineers, mining companies and owners which might be made available to the committee. The committee desires to consider summaries of estimated reserves for districts, but particularly wishes detailed reports on separate mines or deposits with maps, records of shipments, representative analyses, prospecting records, etc.

Concrete Bar Jobs Active

More Large Contracts Placed in Week, with Many Small Lots, While More Work on Which Bids Are Asked Comes Out

REINFORCING BAR PRICES, PAGE 1096

Chicago, Oct. 24.—An unusual number of larger tonnages of reinforcing bars has been booked by sellers during the past week, the volume of small lots keeping up steadily at the same time. In addition, a number of important projects have just been placed before engineering departments of bar companies for immediate action, indicating a continuance of the present activity. While some difficulty is being experienced in obtaining deliveries, bars are going forward to construction points in fairly good volume and no great difficulty is being met. While the nominal quotation continues at 2.50c, Chicago store, this has been shaded occasionally.

Aggregate Large Tonnage

Cleveland, Oct. 24.—Actual contracts placed with reinforcing bar fabricators in the past week are small individually but collectively they are said to represent a round tonnage. Several sizable jobs, including the Collinwood school, Tremont school, Halle Bros. Co.'s addition, school board warehouse, and several others, still are pending, action on any of them likely at any time. Proposed elimination of Pennsylvania railroad crossings here and a new hospital at Camp Sherman, O., which the government has decided to maintain permanently, are expected to call for sizable tonnages of bars. Rail steel bars continue at 2.00c to 2.10c mill or Pittsburgh with 2.50c the warehouse price.

Tonnage Pending Fairly Large

Pittsburgh, Oct. 24.—Fairly large tonnages of reinforcing concrete bars still are pending in this district but relatively small ones alone figure in awards. The general contract for the Altoona, Pa., high school was granted the H. J. Conrath Co., Erie, Pa. About 220 tons of bars will be bought. The purchase of 1000 tons for the Schenley apartments still is deferred. Two or three schools in the Pittsburgh territory will take 100 tons each and bids now are coming in. Bids shortly will be asked upon a building for the Ward Baking Co., North Side, Pittsburgh, involving several hundred tons. Prices continue unchanged at 2.00c to 2.25c, base Pittsburgh.

CONTRACTS PLACED

Awards reported this week..... 3,880 tons
Awards reported last week..... 9,197 tons
Awards reported two weeks ago.... 5,871 tons

700 tons, waterworks, Memphis, Tenn., divided 450 tons to Truscon Steel Co., 250 tons to Laclede Steel Co.
400 tons, high school building, St. Paul, to Cowin & Co., St. Paul.
350 tons, building for E. J. Brach & Sons, Chicago, to Paul J. Kalman Co.
300 tons, sewage tunnel, Paducah, Ky., to Truscon Steel Co.
250 tons, Sheridan Beach hotel, Chicago, to Truscon Steel Co.
225 tons, building for Rochester Packing Co., Rochester, N. Y., to Corrugated Bar Co.
200 tons, warehouse for Texas Fireproof Warehouse Co., Waco, Texas, to Paul J. Kalman Co.
180 tons, Roosevelt road viaduct, Chicago, to Paul J. Kalman Co.
150 tons, Knights of Pythias hall and office building, South Bend, Ind., to Concrete Steel Co.
150 tons, high school building, Cedar Rapids, Iowa, to Truscon Steel Co.
140 tons, First National bank building, Long Beach, Cal., to Llewellyn Iron Works.
135 tons, for United States reclamation service, Denver, Colo., 35 tons to Utah Steel Corp. and 100 tons to Joseph T. Ryerson Co.
100 tons, William Hatch high school, Oak Park, Chicago, to Corrugated Bar Co.
100 tons, buildings for United States aerial mail service, Broadview, Chicago, to Barton Spiderweb Co.
100 tons, building for Rochester Packing Co., Rochester, N. Y., to Corrugated Bar Co.
100 tons, warehouse for Werner Bros. Fireproof Storage Co., Chicago, to Concrete
100 tons, new Vendome apartment building, Milwaukee, to Concrete Engineering Co.

CONTRACTS PENDING

400 tons, new Juneau Surf hotel building, Milwaukee, Hetherington, Kriez & Hetherington, 105 North Clark street, Chicago, architects; bids being taken.
400 tons, hotel for Le Rue Poppenfus, Chicago, bids in.
350 tons, building for St. Frances convent, Dubuque, Iowa, bids closed Oct. 25.
240 tons, First avenue bridge, Sterling, Ill., bids to Oct. 30.
220 tons, general contract for Altoona, Pa., high school, awarded H. J. Conrath Co., Erie, Pa.
200 tons, high school, Evansville, Ind., bids to Oct. 26.
200 tons, Elks club building, Louisville, Ky., bids to Oct. 30.
200 tons, school and assembly hall for St. Mary's congregation, Hyde Park, Cincinnati, bids to close soon.
200 tons, school building, Louisville, Ky., being figured.
150 tons, high school, Laporte, Ind., bids to Oct. 27.
150 tons, J. M. Atherton high school for girls, Louisville, Ky., bids to Oct. 27.
100 tons, Tremont school, Cleveland, bids being taken.
100 tons, elementary school, Pittsburgh, bids taken.
100 tons, South Side high school, Pittsburgh, bids being taken.
100 tons, Carrick high school, Pittsburgh, bids being taken until Nov. 4.

Ferro Deliveries

Against Contracts Are in Demand—Spiegel Inquiries Also Active

FERROALLOY PRICES, PAGE 1096

New York, Oct. 24.—Numerous requests are being made by consumers for deliveries of ferromanganese on their contracts. Sellers deduce from the large number of such requests that stocks of ferromanganese on hand at consuming plants are not large. There is a lack of new demand except for occasional carloads. These are being booked at $67.50, tidewater, plus duty, which in the case of 80 per cent metal results in a total price of $101.10, tidewater. Inquiries for about 2000 tons of spiegeleisen have been put out in the trade but there is no haste in closing them. Business in spiegeleisen during the past week involved only two carloads for prompt shipment. The market on domestic is $37 to $38, furnace, for 20 per cent metal. On a carload of English already arrived, $38.50, duty paid tidewater, was done.

Some large business both in tungsten concentrates and in manufactured tungsten was done the past week at advancing prices. A large tonnage of tungsten ore sold to a consumer at prices ranging from $7.25 to $7.75 a short ton unit. A lot of 150,000 pounds of ferrotungsten sold at 92 cents a pound contained. A lot of tungsten powder sold at $1 a pound contained. Several other large inquiries have been in the market, including one lot of 50,000 pounds and another lot of 100,000 pounds.

Ferrochrome prices are unchanged at 12 to 14 cents for the 4 to 6 per cent carbon grade. New business is light, but consumers have been specifying actively on contracts. Before the end of the year contracts for ferrochrome and ferrosilicon for 1923 will be placed.

New business in 50 per cent ferrosilicon is active, at $70 to $75, delivered. Some sales of Canadian as well as domestic 14 to 16 per cent ferrosilicon are reported.

Interest Is Waning

Pittsburgh, Oct. 24.—Waning interest in ferroalloys is noted with but two or three inquiries out for ferromanganese, one or two for less-than-carload lots and one for a larger quantity. One American producer now is quoting ferromanganese in carload lots at $100, furnace, and another which has quoted $100, seaboard base, now is naming that figure, f.o.b. furnace, also. Less-than-carload quantities have carried quotations as high as $115 per ton. The English price so far as reported here is unchanged at $101.10, Atlantic ports, duty paid.

Another sale of ferrotungsten is noted but demand has been fairly well met for the time being. This particular sale amounted to 22,000 pounds at 85 cents but the copper content is said to be high. Prime ferrotungsten is quoted at 90 cents to 95 cents with $1 talked of in some directions. Ferrochrome now is quoted at 12 to 13 cents, 4 to 6 per cent material. Recently some 5-ton lots of 50 per cent ferrosilicon were purchased but most users are receiving supplies on contracts. Specifications on contracts expiring Dec. 31 are freely furnished since higher levels then are anticipated.

New Pipe Card

Advances Steel Grades $4 to $5—Small Cast Lots Active

PIPE PRICES, PAGE 1096 AND 1158

Pittsburgh, Oct. 24.—On Oct. 19 the National Tube Co. advanced steel tubular goods $4 to $5 per ton, the last referring to ⅛-inch buttweld steel pipe on which the discounts were lowered 2½ points. Other discounts were lowered two points. Independent producers are adopting the same levels with cards dated Oct. 19 supplanting the cards of Aug. 17, 1922. The new quotations approximate those named by a Wheeling district producer for some weeks past, which it has been able to obtain because of being in a better delivery situation. The base discount on 1 to 3-inch black buttweld steel pipe now is 66 off instead of 68 off; galvanized is 54½ off instead of 56½.

New discounts on large outside diameter wrought steel pipe are as follows:

	Jobbers' car loads	Consumers' car loads
14 to 20-inch O.D.....	58	53
21 and 22-inch O.D.....	53	48
24-inch O.D.....	49	44
26 to 30-inch O.D.....	41	36

Discounts of Oct. 19 on lapweld steel boiler tubes are the same as named

by certain independent producers for several weeks past, as follows:

Sizes	Basing
1¼-inch	17½%
2 to 2¼-inch	32
2½ to 3-inch	43
3¼ to 13-inch	48

Full weight standard line pipe likewise is increased in the same ratio discount, being lowered two points. New discounts follow:

BUTT WELD

Size	Basing
2½ and 3-inch	65½% off

LAP WELD

2½ to 6-inch	62½% off
7 to 8-inch	59½% off
9 to 12-inch	58½% off

Merchant casing for water wells, oil country goods, etc., also has been increased $4 per ton.

Not much new business was driven in by the recent price advance because pipemakers largely did not encourage it. They only have accepted orders where they practically were obligated to do so. Some have had to refuse tonnages from supply companies, jobbers and distributors because of heavy orders already on the books. Several pipemakers are filled up for 60 days ahead and are turning down attractive tonnages involving 100 tons or more at a time. Occasional line pipe tonnages still are placed, the latest being the 33½ miles ordered by the Tidewater Oil Co., Bradford, Pa., approximating 1800 tons, from a valley pipe producer.

Wrought pipe business is not particularly heavy just now and operations have been somewhat interfered with from various causes. A. M. Byers Co. has several furnaces down because of a shortage of puddlers.

Merchant seamless tubes have been advanced $4 per ton, locomotive tubes being advanced approximately $8 per ton. The base discount on 3¼ to 4-inch hot-rolled seamless boiler tubes in less-than-carload lots now is 45 off instead of 47 off. Locomotive tubes, 2-inch outside diameter, 12-gage, now are quoted at 14c per foot instead of 13c.

May Buy for Spring

New York, Oct. 24.—The city water department is understood to be contemplating the purchase of approximately 1700 tons of cast iron pipe for delivery early next year; however, it is likely that specifications will not be brought out for at least three or four weeks. At present, municipal demand throughout the district is quiet, with sellers relying principally on private consumers for new business, and this latter, it is said, still is active.

Most Buying in Small Lots

Chicago, Oct. 24.—With the exception of a few sales of larger tonnages of cast iron pipe, most business has been in small lots, industrial and railroad buying being a feature. Cities have been much delayed in the water extension work by delayed delivery and most have considerable tonnage still due from makers. This has put a damper on the market and comparatively little inquiry from this source is coming out. The National Cast Iron Pipe Co. has been awarded 300 tons at Hamilton, Mo. Bids were to be opened Oct. 23 at Ferndale, Mich., on 100 tons.

The Nonferrous Metals

Zinc Higher With Better Market—Copper Firm at Slightly Lower Level—Tin Going Up

	Copper: Electro delivered	Copper: Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Oct. 18	13.87½	14.12½	35.00	6.65	6.82½	20.00	6.85	32.00
Oct. 19	13.87½	14.12½	35.12½	6.65	6.85	20.00	6.85	32.00
Oct. 20	13.87½	14.12½	34.87½	6.65	6.87½	20.00	6.75	32.00
Oct. 23	13.87½	14.12½	35.25	6.70	6.05	20.00	6.75	32.00
Oct. 24	13.87½	14.12½	35.50	6.75	7.00	20.00	6.75	32.00

†Outside market quotation.

NEW YORK, Oct. 24.—Improved railroad traffic conditions have stimulated buyers in some districts to renewed interest in raw material requirements. This is particularly true of the galvanizers served by the Pennsylvania who have inquired actively for zinc the past few days. Copper prices have held steady at the recent slightly lower levels. Lead has been firm. Tin and zinc prices advanced to the highest levels reached in nearly two years. Antimony prices have eased slightly. Aluminum has been in good demand for future deliveries, but difficult to buy beyond this year. Zinc sheets have advanced ¼c.

Electrolytic copper is held at 13.87½c to 14c, delivered, for delivery through January. Export sales have improved lately, while London prices have stiffened following their recent sharp reaction, contributing sentimental strength here. The easing of the market caused some hesitation among domestic buyers and this hesitation still persists. However, fabricators are doing a good business, being booked three months ahead. Some large orders for rolled and drawn products recently have been placed covering shipments well into 1923. Casting copper has held firm at 13.40c to 13.50c, refinery, with good foundry buying reported by producers throughout the country.

Zinc prices have advanced sharply, following the appearance of a fair amount of inquiry in the market. Prime western sold at 6.80c, East St. Louis, a week ago and now is 7c. High grade zinc has been advanced by one leading maker to 8c and is not obtainable under 7.75c, delivered. Sheet zinc base prices are irregular. One mill is quoting 8.75c, f.o.b. mill; another is quoting 9c; still another has withdrawn official prices and is quoting only on specifications as submitted. Business in rolled zinc has been active and the mills are sold from one to three months ahead, at their present operating rate, which is curtailed by shortage of labor and of cars to move ore to the smelters.

Lead business has been less active, with prices firm at 6.40c, East St. Louis, 6.75c to 6.87½c, New York, for prompt and November shipments. The market continues extremely strong.

Straits tin has sold above 35c for both prompt delivery and future shipment. Consumers here have bought actively on the rise, although the market here has much of the time been below the import cost, due to offers of holders who wanted to take profits. The London market has advanced about £15 in the past month, due, it has been thought, to speculative buying by Dutch and British traders, headed by Ricard. Buyers are becoming more cautious. Chinese tin has been offering about 1c under Straits.

Spot antimony has been obtainable at 6.75c, duty paid, in carlots, and at 4.75c, c.i.f. in bond, for importation. Consumers have bought well and have not been interested lately due to stocks on hand.

The market for 98 to 99 per cent virgin ingot aluminum of foreign origin remains 20c to 21c, for shipment from New York warehouse. Buying is light, but consumers continue to show much interest in 1923 needs, especially as the domestic producer is not quoting on deliveries beyond Jan. 1.

Mill Products

(Base prices, f.o.b. mill)

SHEETS	
Copper, hot rolled 24 oz., min	21.50
High brass	18.50
Zinc, ga. 9 to 18 (plates ½c less)	8.50
Lead, full sheets (cut, ¼c more)	9.75
Aluminum, base 18 ga. and up	37.40
SEAMLESS TUBES	
High brass	23.00
Copper	24.75
RODS	
High brass, round, ¾ to 2½ inch	17.00
Naval brass rod	19.00 to 19.50
WIRE	
Copper	15.50 to 16.00
High brass	19.00

Old Metals

(Dealers' Buying Prices)

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	8.50
Chicago	8.50
HEAVY YELLOW BRASS	
New York	6.25 to 6.50
Chicago	6.50
Cleveland	6.00 to 6.50
ZINC	
New York	3.50 to 4.00
Cleveland	3.50 to 4.00
HEAVY COPPER AND WIRE	
Cleveland	11.00 to 11.50
New York	11.00 to 11.50
Chicago	11.00
RED BRASS TURNINGS	
New York	7.75 to 8.25
Cleveland	8.00 to 8.50
YELLOW BRASS TUBING	
Cleveland	6.00 to 6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.25 to 6.75
New York	6.75 to 7.00
Chicago	6.00
ALUMINUM BORINGS	
Cleveland	7.00 to 8.00

Car Shortage

Not To Be Relieved Until After Nov. 15, Officials Say

Washington, Oct. 24.—Railroad officials here foresee decided relief from the car shortage situation after the middle of November. Up to that time the stringency probably will grow more acute, they believe, with the certainty of increased loading of revenue freight. By the middle of December, they forecast, the shortage will be reduced to the extent it will be negligible compared with the more than 2,000,000 freight cars in service.

The record of freight loading reveals that in October, it is heavier than in the remaining 11 months. In recent years November has always seen the curve tending down, with December still lower.

Because 1921 was a complete year of surplus cars it does not afford comparison. In October, 1920, after three weeks of revenue loading exceeding 1,000,000 cars, the drop came in the early weeks of November. So far this October the 1,000,000-car-loading mark has not been reached but it is believed by railroad officials here that it will be attained before the end of the month. In the week ended Oct. 7 loading totaled 968,169 cars. This was a drop of 20,000 from the last week of September. The setback was only temporary, caused by embargoes, it is believed, and heavier loading is expected through October.

The peak of the car shortage of 1920 came in the period Oct. 23 to 31, when the daily average shortage was 147,309 and the surplus 739. In the period Oct. 1 to 8 this year the daily average shortage was 141,252 and the surplus 3954 cars. The period Oct. 8 to 15 this year probably will see last year's shortage topped. It thus appears that last year's highest car shortage mark will be attained at an earlier period this year, while the loading will reach the top somewhat later.

With the close of October the movement of grain and grain products will begin to show a decided decrease. The movement of lumber already has tapered off, and so has that of building and road materials. Coal is holding up, and gives promise of accounting for an abnormally large movement through the remainder of the year. On considering the various factors, railroad officials believe the car shortage will continue severe through the first half of November, but begin to lessen at a decided rate.

So far as service orders are concerned, the only relief afforded by the interstate commerce commission has come through an amendment to service order No. 25, which added foundry sand and materials for car and locomotive construction or repair to the list of commodities which may be loaded in open-top cars in the direction of, but not beyond, the mines to which such open-top cars are destined. The amendment also shut off the car supply of the wagon mines until the regular tipple mines have been accorded a full supply.

Lower Rates on Southern Pig Iron Urged

Washington, Oct. 24.—The southern pig iron industry must have relief from the present high freight rates to northern territory if the industry is to survive, states a brief filed by the Cincinnati chamber of commerce and the Associated Foundries of Cincinnati with the interstate commerce commission, in support of the proposed reduction on southern pig iron to $4.22 per ton to St. Louis and $3.24 to Louisville, Ky. These reduced rates were to have become effective on Sept. 1, but were suspended by the commission when the St. Louis Coke & Chemical Co., of St. Louis, and the Ashland-Portsmouth group of blast furnaces protested.

In proposing the reductions the railroads were actuated with a desire to relieve an intolerable situation in the South, the brief contends. Also, it is claimed that no differential relationships would be disturbed, the rates would not cast any undue burden upon other traffic, the rates are not unjustly discriminatory, and the reductions are in the public interest.

Freight Loading and Car Shortage Grow

Washington, Oct. 24.—Loading of freight in the week ending Oct. 14 was 983,470 cars, a gain of 15,000 over the preceding week and 73,000 over the same week last year. Coal loading was 196,926 cars; coke 10,208; and ore, 46,362, a slight increase over the preceding week for coal and coke and a slight loss for ore.

In the period Oct. 8 to 15, the daily average shortage was 156,309 cars and the surplus was 3884. This shortage is 9000 cars greater than the peak of the shortage of 1920. The coal car shortage was 44,984 and box cars 77,111.

The American Railway association today allotted the Chesapeake & Ohio and the Norfolk & Western sufficient cars to insure the movement of coke to Virginia furnaces under the reduced rates. The roads asked for cars when the shortage threatened to nullify the effect of the reduction.

September Sheet Sale Is Heavier; Output Less

According to data compiled monthly by the National Association of Sheet and Tin Plate Manufacturers, sales of sheets in September increased 13,368 tons over the August tonnage but production fell off 25,798 tons. Shipments decreased from 215,200 tons to 190,027 tons in September, apparently due to curtailed transportation facilities. Unfilled orders on Oct. 1 were practically the same as on Sept. 1. Comparison of tonnages follow:

	August	September
Total sales	175,495	188,863
Total production	228,398	202,600
Total shipments	215,200	190,027
Unfilled tonnage Sept. 1 and Oct. 1	379,249	378,574
Finished stock on hand awaiting shipment	96,058	102,198
In stock, unsold	19,184	21,241

Sales in September represent 75 per cent of the capacity reporting, as against 67 per cent in August, 58.2 per cent in July, and 110 per cent in June. Production in September was 80.4 per cent of capacity reporting; shipments, 75.4 per cent; unfilled tonnage, 150.3 per cent; finished stock on hand awaiting shipment, 40.5 per cent, and tonnage in stock unsold, 8.4 per cent.

The total number of hot mills in the United States is 641, having a capacity for the month of September of 365,000 tons, and the proportion of the capacity to which the foregoing figures relate is about 67 per cent.

Would Guide Trade Bodies

Washington, Oct. 24.—Attorney General Daugherty, in a statement to the chamber of commerce of the United States for its publication, *The Nation*, reiterates his belief that a governmental agency to advise and supervise the activities of business organizations, including trade associations, should be created. Violations of the antitrust laws would be reduced to a minimum if the government would assist the associations in keeping within the law, Mr. Daugherty states. The attitude of Mr. Daugherty now is almost parallel to that of Secretary of Commerce Hoover.

Settles Scrap Purchase

Washington, Oct. 24.—The department of justice has announced that Briggs & Turivas, scrap iron and steel dealers, of Chicago, have agreed to pay $500,000 for steel shell forgings purchased in 1918. When the government delayed delivery of the forgings Briggs & Turivas set up a counter claim of damages resulting from the delay. The acceptance of $500,000 by the government, it is announced, ends the difficulty.

Scrap Prices Go Lower

(Concluded from Page 1102)

sumers continue out of the market. A large sheet interest in this section recently bought a sizable tonnage of steel specialties, estimated to involve approximately 25,000 tons. For this, up to $25 per ton was paid. This buyer now is out of the market, however, and in the absence of further substantiating transactions the market on railroad coil and leaf springs, couplers and knuckles, and steel car wheels has slumped $1 per ton to the basis of $23 to $24. Occasionally a consumer enters the market for small or fair sized tonnages. A Brackenridge, Pa., user again is buying machine shop turnings and is understood to be willing to pay up to $17 for them. This grade is marked up 50 cents per ton accordingly. Recent sales of heavy breakable cast have been at prices $1 lower than the levels recently obtained, or at $20 to $20.50 per ton, while last sales of sheet bar crops too have been upon a lower basis by $1 per ton. A fair-sized tonnage of low phosphorus billet and bloom crops has been moved, bringing as high as $26.

Market Is Stronger

Cincinnati, Oct. 24.—Better scrap buying during the past week by both steel and foundry melters has strengthened the market and while prices have not been advanced buyers are being forced to pay top prices for all grades. Dealers manifest a disposition to quote firmly against all offered tonnage. The recent buying indicates that there is a gradual increase in the foundry melt and the growing scarcity of pig iron is forcing the substitution of scrap in work from which it would be eliminated were conditions different. Among a group of 12 foundries scattered throughout this district that have been in the scrap market more or less irregularly all have been buyers this week of increased tonnage. Five have increased from two runs a week to four and three are running four melts a week against three on Oct. 1.

Some Large Sales Made

St. Louis, Oct. 23.—Considerable diversity of opinion exists as to the status of the scrap market. Consumers are disposed to play a waiting game and are purchasing only such tonnages as they urgently need. The recent advances, they declare have discounted all bullish factors, and they are satisfied to await developments. On the other hand it is pointed out that the market is stronger than in many months due chiefly to the enormous business booked by the mills and foundries and a general scarcity of scrap locally and at other important consuming points. The latest marketing by the railroads of substantial tonnages of scrap have failed to make any impression of reserves. One especially large railroad list, which might have been brought to St. Louis, was absorbed by the East. Virtually all the industries are in need of raw material, and yard stocks are well cleaned out. Two of the leading steel interests are quietly seeking supplies, and stove and jobbing foundries, which have lately augmented their operations, are taking grades suitable for their use. Against these considerations it is pointed out several of the mills have been deluged with scrap and have had to request a slowing down in shipments. One plant has been obliged to suspend operations temporarily because of a breakdown in its machinery. Railroads, which a couple of weeks back declared they were unable to obtain cars for moving their scrap, have managed to secure ample equipment, and are making shipments. The Louisville & Nashville closed a list of 18,000 tons Oct. 18, including about 7000 tons of rails. Virtually all of this material went to eastern consumers. A Peoria, Ill., manufacturer is reported to have purchased 30,000 tons of melting steel, paying $19.50. The tonnage was supplied chiefly by Chicago and St. Louis dealers.

Southern Market Is Firm

Birmingham, Ala., Oct. 23.—An active demand for scrap still exists and prices are receding little. Heavy melting steel is slow, the larger consumer of the district buying at its own price while dealers are holding for $5 per ton more. The consumer is covering its needs in some manner, however. In bringing in stock as quickly as it is going out, dealers have to handle a considerable number of cars. Quotations generally remain at the level noted last week and opinion is expressed there will be no change in the near future.

Steelworks Operations in Valley at High Rate

Youngstown, O., Oct. 24.—Steelworks' operations throughout the Mahoning valley continue at a high rate. While a shortage still prevails the movement of finished products out of the valley has not been retarded to any large extent. Independent open hearth operations continue at 90 per cent with the Republic Iron & Steel Co. charging 12, the Brier Hill Steel Co. and the Youngstown Sheet & Tube Co. 11 each, the Trumbull Steel Co. seven and the Sharon Steel Hoop Co. five, a total of 46 of the 51 units in the district. Sheet mill schedules remain at 98 per cent the same as a week ago with every unit in the valley active except two at the Republic Iron & Steel Co.'s Niles, O., plant.

With 21 stacks in blast, operations throughout the Mahoning valley stand at 75 per cent. Additional stacks are scheduled to be blown in when the coke supply becomes easier. Stacks in blast include five Carnegie Steel Co., four each at the Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co.; three Brier Hill Steel Co.; and one each at the Trumbull Steel Co., the A. M. Byers Co., the Sharon Steel Hoop Co., the Struthers Furnace Co., and the United Iron & Steel Co., a total of 21 of the 28 stacks in the district.

Miscellaneous operations include two plate mills of the Brier Hill Steel Co.; five pipe and six finishing mills and the bessemer department of the Republic Iron & Steel Co.; 10 pipe furnaces, a bar mill and the rod, wire and bessemer department at the Youngstown Sheet & Tube Co.; 19 hot tin mills and all strip departments at the Trumbull Steel Co.

Fire Clay Brick Output Is Less; Silica Gains

Data as compiled by the Refractories Manufacturers' association for September show production of fire clay brick fell from 66 to 62 per cent of the capacity reporting, representing approximately 74,450,000, 9-inch equivalent. About 46,250,000 brick were produced in September. Shipments increased about 5 per cent to 67 per cent of capacity, or about 50,000,000 brick. New orders received during September amounted to 56,780,000 brick, or 76 per cent of the capacity. Orders on record Aug. 31 amounted to 204 per cent while those of Sept. 30 amounted to 199 per cent of capacity or approximately 153,000,000 and 148,500,000 brick, respectively.

In connection with silica brick, production increased about 12 per cent from 35 to 47 per cent, or 11,295,000 brick, the total capacity reporting being represented by approximately 24,000,000, 9-inch equivalent. Shipments were somewhat lower, being about 41 per cent of capacity, or 9,950,000 brick. New silico brick orders received during September were 46 per cent of capacity, or 11,155,000 brick whereas in August they were about 39 per cent. Orders on hand Sept. 30 were 136 per cent of capacity, or about 32,600,000 brick, as against 130 per cent on Aug. 31, or approximately 31,275,000 brick. Unfilled orders of fire clay Sept. 30 amounted to 75,225,000 brick, or 101 per cent of capacity, while unfilled orders in silica on the same date amounted to 77 per cent of capacity, or a total of 18,500,000 brick.

Automobile Production in Seasonal Decline

Figures received by the department of commerce through the bureau of the census show a marked seasonal decrease in the production of both passenger automobiles and trucks in September. The total production of passenger cars in September was 186,562, compared with 249,225 in August, while truck production in September amounted to only 18,843, as against 24,200 in August. The September production is the lowest since last March, but is considerably above the figures for September, 1921, when the total production was reported as 144,669 passenger cars and 13,648 trucks. The following table gives the total production for each of the last nine months of this year.

With a few exceptions, the reports each month are from identical firms and include approximately 90 passenger car and 80 truck manufacturers. September figures are subject to slight revision when all reports have been received.

1922	Passenger cars	Trucks
January	81,693	9,416
February	109,171	13,195
March	152,959	19,761
April	197,216	22,342
May	232,431	23,788
June	263,027	25,984
July	224,057	21,357
August	*249,225	*24,200
September	186,562	18,843

*Revised.

Hardware Men

Warned Against Renewed Inflation—Oppose Immigration Limitation

Manufacturers and wholesale and retail hardware dealers from all parts of the United States attended the twenty-eight annual convention of the National Hardware Association of the United States at the Marlborough-Blenheim, Atlantic City, Oct. 17-20. General trade conditions were discussed from several angles and while prospects were declared to be encouraging, warnings were issued against renewed inflation.

Austin H. Decatur, Decatur & Hopkins, Boston, Mass., president of the association stated that unexpected reaction in business has become apparent during recent weeks and suggested that a return to inflated conditions should not be encouraged. According to the speaker, conservatism should prevail in business management, particularly under present conditions. Labor troubles, he said, have been a serious handicap in many lines of industry, yet business has constantly improved.

Conflicting views regarding the outlook for the sale of automotive parts were expressed at sessions of the automobile accessories branch of the association. Frank T. Chase, Frank Mossburg, Co., Attleboro, Mass., developed the fact that the average sales of accessories last year amounted to $10 a car. On this basis, he declared, there is a good opportunity for the expansion of sales. Mr. Chase predicted a heavy volume of buying of low-priced cars in the near future. C. H. Casey, Jordan, Minn., president of the National Retail Hardware association, warned manufacturers and dealers against expecting too large a volume of buying on the part of farmers. Prospective purchasers in the agricultural districts cannot enter the market for cars and accessories on a large scale until a better market is obtained for their farm products, according to Mr. Casey.

Among the papers read before the metal branch was one devoted to the sheet copper situation by W. A. Willis, manager, Copper and Brass Research association. Mr. Willis discussed the relations between the manufacturers of copper and brass products and the jobbers and dealers. He pointed to the fact that the consumption of copper in 1922 building is estimated at 150,000,000 pounds of which 50,000,000 pounds was used for roofing and 68,000,000 pounds for sheet metal work other than roofing. The consumption is an increase of 100,000,000 pounds over 1921 and 96,000,000 pounds over 1920.

During the convention action was taken on a number of problems confronting the hardware industry. The convention authorized the executive committee of the organization that second class postage rates be increased and that the drop letter rate in cities be reduced to one cent. Members of the American Hardware Manufacturers' association, meeting with the National association, adopted a resolution opposing the limitation of immigration in the United States to a fixed number. The resolution favors selective tests to admit such immigrants as would beneficially assimilate with American citizenship. Tests at the port of embarkation as well as at the port of arrival in this country are recommended.

The election of officers of the National Hardware Association of the United States was announced Friday. F. A. Heitmann, F. W. Heitman Co., Houston, Tex., was elected president; Brace Hayden, Dunham, Carrigan & Hayden Co., San Francisco, and John M. Townley, Townley Metal & Hardware Co., Kansas City, Mo., were elected vice presidents; and T. James Fernley, Philadelphia, was re-elected secretary-treasurer.

Manufacturers Hear Talk on Rail Problems

Boston, Oct. 24.—One cause of the present car shortage is the shackling of the railroads by the interstate commerce commission, according to Walker D. Hines, former director general of railroads, who spoke last week before members of the Associated Industries of Massachusetts in Boston. "The railroads at present" said Mr. Hines, "have little to say about rates and working conditions, but there are some things the railroads can do. They can increase the efficiency of labor, and can put into effect further economies in management and operation, and it is success in these lines that is to decide between government and private ownership." Charles M. Schwab of the Bethlehem Steel Corp. also spoke, saying in part, "The general tendency of business is always upward and onward. Don't be afraid to spend your dollars in American business. If I have been able to do things in the past, it is because of my continuing faith in America." Over 1200 members attended the meeting, and re-elected Charles R. Gow as president for the ensuing year.

Coke and Coal Output Gaining Slowly

Washington, Oct. 24.—Production of beehive coke in the United States in the week ended Oct. 14 amounted to 183,000 tons, according to the report of the geological survey. The daily average was 31,000 tons, compared with 29,000 tons in the week ended Oct. 7, and 16,000 tons in the week ended Oct. 8, 1921. Comparisons of tonnages by districts follow:

	Week ended		
	Oct. 14, 1922	Oct. 7, 1922	Oct. 8, 1921
Pennsylvania and Ohio	139,000	130,000	72,000
West Virginia	14,000	12,000	3,000
Alabama, Tenn. and Ga	9,000	11,000	8,000
Virginia and Kentucky	10,000	10,000	6,000
Colo. and New Mexico	6,000	6,000	2,000
Washington and Utah	5,000	4,000	3,000
United States total	183,000	173,000	94,000
Daily average	31,000	29,000	16,000

Returns on coal production in the week ended Oct. 21 show an increase to about 10,200,000 tons of soft coal. Production of anthracite was at about the same rate as during the preceding week, 2,000,000 tons. In the week ended Oct. 14 output of soft coal amounted to 10,021,000 tons.

Machinery Builder Buys Trailmobile Plant

Cincinnati, Oct. 24.—The J. A. Fay & Egan Co., this city, has purchased the plant of the Cincinnati Trailmobile Co. and has abandoned its project of erecting a new plant in Bond Hill, plans and specifications for which had been approved and for the construction of which bids were being taken. The Trailmobile plant was erected in 1919 and is of modern construction being composed of twelve one-story brick and glass building units of sawtooth roof design.

The Fay & Egan Co. will move about Jan. 1 from its present location upon the site of which will be erected a $3,000,000 terminal warehouse. The purchase price of the Trailmobile plant is said to have been $700,000. The machinery was not purchased.

Horseshoe Makers Fewer

Washington, Oct. 24.—Makers of horseshoes, who numbered only 12 in 1921 compared with 20 in 1919, used materials in 1921 costing $954,778 against materials in 1919 costing $1,536,619, the census bureau reported today. The value of products was $1,931,812 in 1921 and $3,367,001 in 1919. Persons engaged in the industry totaled 306 in 1921 against 919 in 1919, and their salaries and wages aggregated $559,067 in 1921 and $1,215,854 in 1919.

Coast Plans New Plants

Building Permits Issued Indicate Another Banner Month—Inquiry Out for 1000 Tons of Foreign Iron—Tubular Products Are Active

LOS ANGELES, Oct. 21.—Trading in iron and steel continues heavy. Industrial activity is increasing and many new plants have started and more are being planned. Including Oct. 10 building permits issued totaled 1647 with an estimated value of $4,279,334 and another $12,000,000 month is expected. Due to the inability of eastern mills to secure cars for steel shipments stocks in this locality are becoming low and consumers are concerned.

Pig Iron and Coke

The pig iron market here is more active than it is in the northern section of the state and it is estimated by one dealer foundry operations are close to 75 per cent of capacity. Sales recently have comprised small lots, although it is understood one interest is in the market for 1000 tons of foreign iron. Belgian iron is being quoted at $32 to $33 a ton c.i.f. for foundry pig equivalent to No. 1 foundry while off grades are bringing $28 to $29 a ton c.i.f. One user states they received an offer on Belgian material running 2.75 to 3.25 silicon, 1.25 manganese, 0.6 to 0.9 phosphorous and 0.04 sulphur at a price considerably under $27 a ton c.i.f. San Pedro duty paid.

A fair tonnage of coke is moving, mostly in small lots. English beehive coke is being quoted at $20 to $22 and by-product at $18 to $20 c.i.f. San Pedro. No outstanding sales are noted.

Bars, Plates and Shapes

Bar mill operators report a good tonnage coming in. Large awards of concrete bars have been scarce. Jobbers prices on reinforcing material are 3.00c f.o.b. Los Angeles for carload lots and 3.20c for less than carload lots.

Plates are in fair demand but no large inquiries are current. While an occasional rumor is heard of a price less than 2.45c c.i.f. Pacific Coast ports on plates, this price appears to be the minimum figure obtainable. The leading interest is understood to be quoting around 2.60c. Some business is going at higher prices and one lot of 200 tons went at 2.70c.

Fabricators report a good demand for structural shapes in small lots and have their shops filled with work. No large awards are noted. The Los Angeles harbor commission will open bids Oct. 27 for 475 tons for a transit shed and on Nov. 3 for 500 tons more for another shed.

Other Finished Material

On galvanized sheets 4.50c base Pittsburgh appears to be the minimum as it is understood the Steel corporation will accept no more tonnage for fourth quarter and have not opened their books for first quarter delivery. Many mills are quoting 4.60c base. The Pacific Electric Co. awarded 5245 kegs of track spikes and 700 kegs of track bolts to the Colorado Fuel & Iron Co.

All forms of tubular goods are active and an acute shortage in standard pipe, especially building sizes, is reported here. An advance of 2½ points on 1 inch and 2 points on all other sizes went into effect today. The present trend of oil production in California indicates all past production records for the state will be broken during 1922. Oil field operations reported to the state oil and gas supervisor for week ending Oct. 14 show 21 new wells started, as compared with 33 the preceding week. The total new wells to date this year number 1096, as compared with 1084 the same date last year. Deepening or redrilling jobs numbered 9, as compared with 13 the previous week. Yearly total to date 629; total same date last year 564.

Warehouse Market

Out-of-stock jobbers here report a volume of business coming in but are of the opinion the total tonnage will be less than the preceding month because some orders received cannot be filled on account of stock shortage. Blue annealed and galvanized sheets, pipe and nails are in better demand than the other forms of steel products. Only one change in warehouse prices here is noted, plates have been advanced $1 per ton, from 3.65c to 3.75c.

Buying Lull

Not So Pronounced on Coast at This Season—Scrap Sales Brisk

Seattle, Oct. 21.—Although car shortage is forcing the closing of a number of logging camps and lumber mills trade conditions are good. Iron and steel dealers are optimistic over the outlook. The lull in buying, expected at this season, is not as pronounced as usual notwithstanding the handicaps under which industry is laboring. Stocks are depleted and dealers report continued difficulty in getting deliveries. Orders placed 90 days ago are still on the way. Some of the largest companies are practically out of a number of lines. Exporters state business is quiet. Japan is not buying except steel scrap while not much inquiry is coming from China although a number of orders for steel bars have come from that market recently.

Pig Iron and Coke

The volume of pig iron sales continues satisfactory and new orders are being placed in foreign centers as warranted by demand. Prices are firm with the best grades of foreign pig iron being offered at around $33. No domestic iron is in stock and none being offered at present. Foreign coke in stock and enroute is sufficient to care for the coast demand so that Fernie coke is not receiving much attention. However, the consuming public is expected to buy Fernie when foreign supplies are exhausted although there may be keen competition between the two varieties which are offering at about the same price here.

Bars, Plates and Shapes

Demand for merchant bars has fallen off although reinforcing bars are being sold in heavy volume. The local steel mill is operating two open-hearth furnaces and business is reported much heavier than at this season last year. Some jobbers report a shortage in plates as the turnover recently has been extremely large with considerable repair and renewal work under way.

Other Finished Material

Stocks of sheets are reported low as this item has been in demand and dealers are having difficulty in replenishing stocks. A shortage of pipe in small sizes exists although the situation is not as acute as 60 days ago. Supplies of stovepipe material are exceedingly low as the run on this stock has been heavy and orders have not been filled promptly. Everything in the building lines and items used by logging and lumber manufacturers are in demand although jobbers anticipate an easing off soon.

When eastern manufacturers are again in position to guarantee prompt deliveries local buyers are certain to place heavy orders as stocks on this coast are at an unusually low ebb. The market is firm and although no changes in prices have been announced during the week there is talk of an advance.

Old Material

Scrap dealers report a brisk business with prices firm and supplies low. The market for cast iron scrap is noticeably stronger, prices ranging from $21 to $22. Foundries are buying freely and dealers are unable to get fresh supplies to keep up stocks. Japanese buyers are still seeking steel scrap but this material is difficult to secure. Prices have advanced to $12 and unless stocks can be replenished a further advance is not unlikely. Aside from the Japanese demand for steel scrap dealers report no foreign inquiries. Less than 12 days from Pittsburgh 38 carloads of steel have arrived at Seattle for shipment to Alaska for the Alaska engineering commission. This is exceptionally quick delivery.

Three of the largest oil companies have delivered drilling outfits in the Coal bay district in Alaska where operations will be prosecuted during the winter. Dealers in iron and steel are watching closely these developments.

Only three steel bridges are included in the improvement program of King county for 1923. These include a 200-foot steel span to cost $25,000, a 170-foot span to cost $20,000 and a 150-foot project estimated to cost $10,000.

The $1,200,000 Dexter Horton office building, the foundation of which now is being constructed will require 1650 tons of steel. The subcontract for erecting the framework has been let but the steel will be furnished by the general contractors, the Puget Sound Bridge & Dredging Co.

British Export Values Higher

Fair Volume of Inquiry Continues for Pig Iron for United States—French Foreign Business Also Picking Up—Fordney Tariff Has No Effect on Shipments of Ferromanganese—Galvanized Sheets Advanced

Iron Trade Review Staff Cable

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IRON TRADE REVIEW,
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Sterling—$4.45

LONDON, Oct. 23.—A fair volume of inquiry from the United States for pig iron is noted in the British market including two 10,000-ton lots of foundry iron, some low phosphorus iron, and 2700 tons of hematite wanted by a New York interest for shipment to South America. The market is firmer. Middlesbrough No. 3 foundry iron is not obtainable for export under £4 12s 6d ($20.57). West coast hematite is being sold to consumers in the United States as low phosphorus iron and at the same price, £4 12s 6d f.o.b. Lorraine producers have taken 5000 tons of foundry iron for delivery to the United States at 230 francs per ton ($17.25) f.o.b. Antwerp. The French exporters are helped by the weak state of the exchange.

The Fordney tariff has had virtually no effect on the volume of shipments of ferromanganese. British exports of pig iron and ferromanganese to the United States in September totaled 52,600 tons and the exports are expected to be heavier in October.

As a result of the continued flow of export orders, three more British stacks are to be blown in soon. All signs indicate higher pig iron values in the export areas the rest of the year.

French Luxemburg furnaces are exporting 15,000 tons of pig iron weekly through Antwerp.

The steel trades are in a slightly better position as a result of a few shipbuilding orders. Galvanzed sheets have been advanced 10 shillings ($2.22) in the Birmingham district.

Quarterly Meetings Are Unproductive of Trade

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$4.43

BIRMINGHAM, Eng., Oct. 13.—The quarterly meetings of iron and steel traders held this week in Birmingham and elsewhere have been singularly unproductive of new business in spite of the large attendances. Obviously, they have been utilized chiefly for inquiry purposes. At Birmingham all the ports were well represented. The most noteworthy contingent was the large body in attendance from South Wales where it appears the more hopeful outlook in eastern Europe is already reflected in improving business in sheets and tin plate.

The usual monthly statistics of the National Federation of Iron and Steel Manufacturers afford the most substantial evidence of improvement. The output of steel ingots and castings during September was 555,900 tons. This is the best record since December 1920 when the output was 746,600 tons. The percentage in September was 73 per cent of the average monthly production in 1920 and 87 per cent of the 1913 average. The September figures represent about 50 per cent of the present capacity of the British steelworks.

The figures have been received with a little surprise, in view of the rather insignificant place which steel appears to occupy in the home trade. It is evident that there is a steady and large expansion of overseas business. This is demonstrated by the export figures just issued by the Board of Trade showing total shipments of iron and steel amounting to 279,168 tons against 133,324 for the corresponding period of last year. For the nine months this year the total was 2,340,832 tons, as compared with 1,145,735 for the corresponding period of last year. Whenever home demand gets abreast of that of exports the British steel trade will be getting busy.

In the pig iron department the progress is less striking and is clearly attributable in no small degree to the large buying by America generally recognized to be a temporary phase. The production of pig iron during September was 430,300 tons, the best total since the pre-coal strike month of February 1921, when the output was 463,600 tons. This figure compares with a monthly average of 669,500 tons in 1920 and 855,000 in 1913. There was an addition of 13 to the operating furnaces during September as compared with an increase of nine in the previous month. Pig iron production included 123,700 tons of hemitite, 137,800 tons of basic, 113,400 of foundry and 25,900 of forge pig iron.

Generally, a hopeful view is taken of the situation. Fairly heavy lots of pig iron have been shipped this week from Middlesbrough, and the scarcity of iron has become very marked. In hematite there is a decided improvement, the home and foreign demand making inroads into stocks. Several furnace owners are prepared to risk a possible slump following the termination of the American demand, and furnaces are being made ready not only in Scotland but in the Barrow-in-Furness area. Furnaces are to be blown in at the Carnforth ironworks in the Cumberland area and others are being made ready.

The rail business at Barrow-in-Furness is slowly but steadily expanding, and there are signs that the steelworks on the Clyde will be busier shortly in view of the number of ships which have been contracted for. A rather healthy sign is the placing by British railways of a few orders for bridges, which has become a feature of the constructional engineering department. It is understood that Dorman, Long & Co., Middlesbrough, have secured the order for 9000 tons of steel for the construction of a bridge in South Africa, a contract for which was placed recently.

Some of the Midland steelworks have reduced their prices for bars from £9 15s ($43.29) to £9 5s ($41.08), due to the complaint that constructional engineers on the Clyde and the northeast coast could get their steel cheaper by 10 shillings ($2.21) per ton than competitors in the Midland area.

Foreign competition in steel is becoming less important. One concern which recently quoted £6 12s 6d ($29.34) for Belgian joists now demands £6 17s ($30.34). Other firms quote unchanged prices, but delivery on contract is becoming more uncertain. Some firms will not supply steel before January. The most favorable quotations for Belgian joists show an advantage of about 15 shillings ($3.32) per ton as compared with the English material.

The decided preference given by engineers to rolling firms issuing weekly programs is leading to an extension of the system. Under the present regime of small contracts it is an obvious advantage to an engineering firm to obtain supplies of steel at short notice by taking advantage of a rolling program.

The iron trade of South Staffordshire continues practically stagnant, a number of works having not produced a ton of iron for several weeks. The

Current Iron and Steel Prices of Europe

British Market

Home Market Prices. Gross Tons at Works or Furnace.

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	28.93	6 10 0
Sheet bars	27.82	6 5 0
Wire rods	40.05	9 0 0
FINISHED STEEL		
Steel bars, England, ⅜ to 3-inch	37.27	8 7 6
Steel bars, England, ⅜ to 3-inch, for export	35.60	8 0 0
Plates, ship, bridge and tank, England	37.83	8 10 0
Plates, ship, bridge and tank, England, for export	36.16	8 2 6
Plates, ship, bridge and tank, Scotland	37.83	8 10 0
Plates, ship, bridge and tank, Scotland, for export	36.16	8 2 6
Beams, England	36.72	8 5 0
Beams, England, for export	35.60	8 0 0
Beams, Scotland	35.60	8 0 0
Beams, Scotland, for export	34.50	7 15 0
Sheets, black, 24 gage	45.62	10 5 0
Sheets, galvanized, 24 gage	73.43	16 10 0
Rails, 60 lbs. and over	35.60	8 0 0
Rails, 60 lbs. and over, for export	33.38	7 10 0
Tin plate, base box, 108 lbs.	4.24	0 19 0
Steel hoops	45.62	10 5 0
Steel hoops, for export	44.50	10 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	20.59	4 12 6
Hematite, West Coast, Mixed Numbers	20.59	4 12 6
Basic Middlesbrough	17.80	4 0 0
No. 3 Foundry, Middlesbrough	20.59	4 12 6
No. 3 Foundry, Derby, Leicester, Nottingham	18.36	4 2 6
No. 3 Foundry, Northamptonshire	17.80	4 0 0
No. 3 Foundry, Staffordshire	17.80	4 0 0
No. 3 Foundry, Scotch	22.81	5 2 6
Ferromanganese, 76 to 80 per cent	66.75	15 0 0
Ferromanganese, 76 to 80 per cent, for export	62.30	14 5 0
COKE		
Yorkshire furnace	4.90	1 2 0
Yorkshire foundry	6.12	1 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	7.62	38,099
Foundry, No. 3, Oberhausen	6.53	32,626
Bessemer Stahleisen, Siegen	6.30	31,497
COKE		
Ruhr furnace	1.48	7405
Ruhr foundry	1.54	7702
SEMIFINISHED STEEL		
Billets	7.59	37,940
Sheet bars	8.13	40,660
Wire rods	7.91	39,530
FINISHED STEEL		
Standard rails	9.50	47,500
Merchant bars	9.39	46,930
Structural shapes	9.28	46,380
Ship plates	10.55	52,750
Medium plates, 3 to 5 millimeters	11.95	59,730
Sheets, below 3 millimeters	13.11	65,570
Tin plate	20.40	102,000
Plain wire	10.08	50,400
Bands and strips	10.89	54,430

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	19.25	270
Basic Bessemer, Lorraine	15.69	220
Foundry, Longwy, No. 3, sand-cast	14.97	210
Foundry, Longwy, No. 3, chill-cast	15.69	220
Ferromanganese, 76 to 80 per cent	67.38	945
COKE		
French furnace	6.77	95
German furnace, f.o.b. frontier	6.77	95
French foundry	8.84	124
SEMIFINISHED STEEL		
Blooms	22.82	320
Billets	24.60	345
Sheet bars	25.67	360
FINISHED STEEL		
Standard rails	39.22	550
Merchant bars	31.73	445
Angles	33.87	475
Normal beams and profiles	33.87	475
Plates, ship and tank, 10 millimeters and thicker	43.49	610
Plates, bridge and tank, 5 to 10 milimeters	46.35	650
Sheets, black, 3 millimeters	49.20	690
Sheets, blue annealed, 2 millimeters	52.05	730
Shafting, cold-drawn, 40 to 60 millimeters	60.61	850
Bars, 2 per cent nickel steel	78.43	1100

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	14.47	220
Basic open-hearth, Belgian	14.79	225
Gray forge, Belgian	14.47	220
Foundry, No. 3, Belgian	15.78	240
Foundry, No. 3, Luxemburg	15.78	240
Foundry, No. 3, Lorraine	15.78	240
SEMIFINISHED STEEL		
Blooms	21.70	330
Billets	22.68	345
Sheet bars	24.33	370
Wire rods	33.20	505
FINISHED MATERIAL		
Standard rails	27.94	425
Merchant bars	28.60	435
Normal beams and profiles	26.30	400
Plates, 5 millimeters and thicker	31.89	485
Sheets, black, 3 millimeters	34.52	525
Sheets, galvanized, 1 millimeter	96.98	1475
Plain wire	42.41	645
Galvanized wire	58.19	885
Wire nails	33.20	505

All prices are f.o.b. furnace or works.

works producing common material have been sliding their prices for several weeks with the result that common iron is now at least £2 10s ($11.07) cheaper than best iron. Usually the difference is about £1 10s ($6.63).

The large contingent of Welsh tin plate makers attending the Birmingham quarterly meeting reported their mills are busy, largely as the result of the more hopeful situation in eastern Europe. Continental inquiries are better, and fairly good sales have been made to Mexico, Canada and South America. There are complaints, however, of unprofitable production on the basis of 18 shilling 9 pence ($4.15). A few are claiming 19 shilling 6 pence ($4.31) and although the lower figure is accepted, an increasing business is done on the basis of 19 shilling ($4.20). During the past few weeks some little improvement has been made in the galvanized sheet trade enabling somewhat better prices to be quoted. For 24 gage sheets, the figure is £16 5s ($71.98) f.o.b. Liverpool, with £18 ($79.84) for 26 gage, and £20 5s ($89.70) for 30 gage.

Predict Drop in Exports to United States

European Special Service

MIDDLESBROUGH, Eng., Oct. 12.—This iron and steel exporting district has greatly benefited by the demand for pig iron for delivery to the United States. A considerable tonnage is yet to be delivered. Exporters, however, take the view that the boom is on the wane and that in the last quarter of the year there will be fewer deliveries on American account. During September the pig iron exported to the United States totaled 31,119 tons, a very large amount when the fact is considered that during a period of five months only 71,700 tons of pig iron was exported to meet American wants. One vessel carrying a car-

Sterling—$4.42

go of about 6000 tons of special iron has met with disaster on the Scottish coast. There is little likelihood of the cargo reaching its destination. It was for delivery to Boston and the selling price was stated to be £4 17s 6d ($21.54) per ton.

Germany continues to buy in the Cleveland market and took 8400 tons of pig iron in September, three times the quantity delivered to German buyers in August. Trade with India continues brisk and there has been a fair demand from Belgium. Tonnages shipped from the port of Middlesbrough to 29 overseas customers during September included the following:

Destination	Pig iron	Manufactured iron	steel	Total
Argentina	...	...	1,951	1,951
Belgium	3,933	1	36	3,970
France	1,695	...	303	1,998
Germany	8,460	...	65	8,525
India	145	1,303	6,519	7,967
Italy	2,205	...	2	2,207
Japan	300	...	1,497	1,797
Siam	70	9	610	689
Sweden	2,255	...	459	2,714
Switzerland ...	886	...	...	886
United States..	31,119	...	...	31,119
Victoria	25	...	1,904	1,929
Australia	100	...	635	735
All other destinations	8,437	1,035	6,219	15,671
Total	60,433	2,417	24,260	87,110

Ore imports during September were heavier than in August. The total quantity shipped to Middlesbrough up to Sept. 30 reached 137,531 tons compared with 116,892 in August. There is at present a lull in the demand. Charters for Mediterranean ore are more in demand than for Bilbao ore. Mediterranean ores are offered at about £1 3s ($5.08), c.i.f. Tees. Rubio ore is £1 4s ($5.30).

The coal export trade is brisk. Deliveries from the Tyne continue to improve. Prices are firm. Best Blyth steam coal is £1 5s ($5.52) per ton. A steady business is being done in bunker coal at £1 1s 6d ($4.75) to £1 2s ($4.86). Gas coke, for which there is a better demand, is £1 10s ($6.63) for prompt delivery and £1 11s ($6.85) for contract.

The manufactured iron and steel trade shows slight indications of improvement. Wages have undergone another reduction of 7½ per cent. The wage decrease this year amounts to 30 per cent. The average net selling price of manufactured iron for the two months ended August by which wages are governed was £10 12s 11.90d ($47.07). This is the lowest price recorded since Feb. 28, 1916, when the average was £10 14s 4d ($47.37). The output of bars and angles by the associated companies connected with the board of conciliation and arbitration for the manufactured iron and steel trade of the north of England for July and August reached 1898 tons. The total output for the two preceding months was 2026 tons.

German Troubles Are Not Diminishing

European Special Service

DUSSELDORF, Germany, Oct. 13.—The iron and steel industries still suffer from the depressing effect of scarcity of money and credits; lack of raw material; the continued heavy depreciation of the exchange; decreasing production and exports and the uncertainty about the interior and exterior position of the republic. Under these circumstances, business has suffered. The building trade, which was active until August of this year, has been stopped for the most part, depriving the steel market of a useful outlet. Export business is difficult to secure although demand from abroad has been active. However, even at the low value of exchange, foreign buyers see no profit on purchases from Germany. Some plants have endeavored to get export orders at any price. This combined with the competition of French and Belgian mills has had an unfavorable influence on export business. However, if the export trade is lost the possibility of getting foreign values, most urgently wanted for buying food and clothing is gone.

Imports of all foreign raw material, as English and Swedish pig iron, English coal and coke, French and

Mark—$0.00038

Belgian semifinished products have decreased, the buyers no longer having the necessary money to buy quantities previously imported. The labor situation is generally calm, following the increase in wages and salaries conceded last week. As much as 125 marks ($0.048) per hour is being paid for an unskilled man, and 147.50 marks ($0.056) for a skilled worker.

Fuel remains scarce, especially the better qualities, and prices have been increased by an average of 1000 marks ($0.38) per ton. The scarcity of coke, in particular, continues, and there are at least 30 blast furnaces idle in the Ruhr district owing to lack of fuel.

Foreign ore prices are weaker and are being pressed on the market; inland ore prices are increasing weekly and are to be fixed in proportion to the value of the pound. Most mills are well booked with orders, but some of them have had no new orders for several weeks.

In consequence of the increase in fuel prices on Oct. 1, pig iron prices for delivery between Oct. 10 and 20 have been raised as follows: Westphalian hematite 38,099 marks ($15.24), at Oberhausen; Westphalian steel pig iron low in copper 37,431 marks ($14.97) at Oberhausen; Westphalian foundry pig iron No. 1 32,696 marks ($13.08) at Oberhausen; Westphalian foundry No. 3 32,626 marks ($13.05) at Oberhausen; Luxembourg foundry No. 3 31,271 marks ($12.51) at Luxemzourg frontier; Siegen steel pig iron 31,497 marks ($12.60) at Siegen; Siegen spiegeleisen with 8-10 per cent manganese 34,444 marks ($13.78) Siegen; 10 per cent ferrosilicon 43,385 marks ($17.35) Duisburg.

According to the exchange clause, the increases on Westphalian hematite, Westphalian foundry Nos. 1 and 3, Luxembourg foundry No. 3, and 10 per cent ferrosilicon are made retroactive from Oct. 1. The pig iron syndicate draws the attention of its buyers to the further increases in pig iron prices which may be expected on Oct. 15, as a consequence of the further rise in railway freights by another 60 per cent. Now it is certain that each fall in the value of the mark will be followed by a corresponding increase in prices which may even be applied two or three times a week.

Czech Works Continue To Reduce Prices

European Special Service

VIENNA, Australia, Oct. 13.—Although Czech works claim to have been selling at a loss, they have reduced their prices once more. Five of the large steelworks have stopped working; others operate a few days per week. The Witkowitz works have been able to avoid a complete stoppage only because the workers have agreed to their wages beign reduced 30 per cent. The number of unemployed on Sept. 1, was 163,000.

The most important reductions in prices are: Bar iron, beams and shapes, from 2350 to 2150 crowns, per metric ton ($73.55 to $67.29); bands from 2750

Czech Crown—$0.0313

to 2550 crowns ($86.07 to $79.81); sheets 3 to 5 millimeters, from 2500 to 2400 crowns, ($78.25 to $75.12); sheets, 1 to 3 millimeters, from 2700 to 2500 crowns, ($84.51 to $78.25); heavy sheets from 2500 to 2300 crowns, ($78.25 to $71.99).

The Czech government has abolished the import duty on pig iron and ferroalloys. In the first half of 1922 the import of iron and iron products increased to 160,000 metric tons, against an export of 70,000 tons. The export of machinery was approximately 14,000 tons.

Austrian works cannot accept fresh orders without long terms of delivery. Only small quantities of foreign material are coming in, owing to the difficulties arising from the state of foreign exchange. Czech material is too expensive. In general Austrian industry is for the time being well stocked with pig iron and semifinished steel. The machine industry is well engaged, and the railway car industry has orders on hand sufficient for six months. The entire industry is suffering from a great shortage of money.

Within the first half of 1922 the total

of Austrian imports diminished to 3,620,000 metric tons, while exports increased to 930,000 tons. Imports included 2,500,000 tons of coal, 86,500 tons of pig iron, 49,000 tons of finished and semifinished steel and 10,200 tons of machinery. Exports included 20,300 tons of pig iron, 71,600 tons of finished and semifinished material, and 19,400 tons of machinery.

The four largest Hungarian machine and car factories have joined into a concern rated as among the greatest industrial enterprises of Central Europe, and giving employment to about 20,000 workers. The Alpine-Montan-Gesellshaft has with Stinnes constituted a Hungarian company that is to make the Hungarian market an outlet for Austrian steel. In the first half of 1922 Hungary imported 34,800 metric tons of iron and steel, and 4600 tons of machinery, as well as 116,000 tons of iron ores.

Data relating to the first half of 1922 show that the economic life of Russia was still paralyzed. The total imports for the first six months amounted in value to 80,300,000 gold rubles ($40,000,000), 46,200,000 of these representing food and the remainder industrial products. Exports were represented by 20,700,000 gold rubles ($10,350,000) being almost exclusively raw materials. Production has made no noticeable improvement, and continues to be but a small percentage of prewar activity.

Japan Postpones Railroad Electrification

Foreign Special Service

TOKIO, Japan, Oct. 13.—The government's policy of retrenchment in all public work has caused further depression in the steel market. The projected electrification of the Tokio-Kobe line has been deferred by the government until, 1925-1926, much to the disappointment of railroad and railroad equipment producers and importers. Importers who did a large business in connection with the recent electrification of the Tokio-Odawara and the Tokio-Yokosuka lines anticipated a large volume of business to result from the government's plan to electrify the Tokio-Kobe line, and American, British, Belgian and German makers were seeking contracts.

Yen—$0.48

The government steel works has closed the plate rolling mills at Yawata, the mills having heavy stocks on hand. The Nitto Steel works also have been closed due to the accumulation of sheets. Three German experts engaged by this firm have now found employment with the government steelworks.

In the pig iron market local melters have started their fall buying in a limited way. No. 1 Japanese pig iron is quoted at 65 yen, ($31.20); No. 2 at 61 yen ($29.28) and No. 3 at 58 yen ($27.84) per ton. No. 1 Hanyang (Chinese) iron is 63 yen ($30.24). No. 3 Cleveland is 70 yen ($33.60). Indian (Tata) iron is quoted at 55 to 58 yen ($26.40 to $27.84). In the steel market round bars are quoted at 4.20 to 4.50 yen ($2.01 to $2.16) per 10 kwamme; flat and square bars 4.70 yen ($2.25); plates 4.20 yen ($2.10) and sheets, 7 yen ($3.36).

Canada Importing More British Iron

Foreign Special Service

TORONTO, Ont., Oct. 24.—An easing off in demand for pig iron is reported by blast furnace interests. Melters show little concern regarding future requirements, and buying for the last quarter is practically at a standstill. A feature of the market is the large importation of English and Scotch iron. The recent downward revision in prices by Ontario producers has not had a stimulating effect on demand. No. 1, (2.25 to 2.75 silicon) and malleable are quoted at $36.30 and No. 2 (1.75 to 2.25 silicon) $35.30, Toronto. Montreal prices on iron produced in Canada are: No. 1, and malleable, $38.70 and No. 2, $37.70. Carron and Summerlee brands of imported iron are quoted $33 to $35 per ton, dock, Montreal.

Local mill representatives report activity in practically all lines of finished iron and steel. In some districts transportation delays are encountered. Building construction continues brisk and during the week a number of good contracts were placed for structural steel. Shapes and beams are quoted at 2.40c to 2.50c, Toronto. Bars continue in strong demand and mills are still about six weeks behind in deliveries. Consumers and jobbing interests are entering the market with orders for last quarter on a more extensive scale than formerly. Producers have little to offer on spot account. Bars are quoted at 2.60c to 2.80c, Toronto. An improvement is reported in buying of plates and orders on producers' books assure them of operations throughout the remainder of the year. Plates are selling at 2.30c to 2.40c, Toronto.

Sheet mills are operating full time, but are six weeks behind with deliveries, and are unable to quote on spot account. No. 28 gage black sheets are 4.50c, and galvanized, 5.50c, Toronto.

Mills are still buying heavy melting steel and turnings. Dealers are offering $10 to $11 per gross ton, Hamilton, for heavy melting steel and $5 to $6 per gross ton for turnings. Dealers continue to pay $10 for scrap rails and $16 per gross ton, Toronto, for axles. They offer $17 to $18, per net ton, Toronto, for machinery cast but have difficulty in obtaining supplies. Stove plate and malleable scrap are being purchased by dealers at $11 and $14, respectively, Toronto.

British Pig Iron Output Shows Gain

London, Oct. 13.—According to the report of the National Federation of Iron and Steel Manufacturers, the production of pig iron in Great Britain in September amounted to 430,000 tons, the highest attained since February, 1921, when the output amounted to 463,600 tons. However, production is only 64 per cent of the average monthly production in 1920, and 50 per cent of the average monthly production in 1913. On Sept. 30, 139 furnaces were in blast, compared with 126 in August and 117 in July. Production included 123,700 tons of hematite, 137,800 tons of basic, 113,400 tons of foundry, 25,900 tons of forge and 29,500 tons other grades.

Output of steel ingots and castings in September amounted to 555,900 tons, a figure higher than in any previous month since December, 1920, when the output reached was 746,600 tons. September production represents 73 per cent of the monthly average in 1913, and about 50 per cent of the steel making capacity of the country. Details of production since 1920 are as follows:

	1922	1921	1920
Pig Iron			
January	288,000	642,100	665,000
February	300,100	463,600	645,000
March	389,800	386,000	699,000
April	394,300	60,300	671,000
May	407,900	13,600	739,000
June	369,200	800	726,000
July	399,100	10,200	750,600
August	411,700	94,200	752,400
September	430,300	158,300	741,000
October	.....	235,500	533,200
November	.....	271,800	403,200
December	.....	275,000	682,500
Steel Ingots and Castings			
January	327,500	393,400	754,000
February	418,800	483,500	798,000
March	549,400	359,100	840,000
April	404,200	70,600	794,000
May	462,300	5,700	846,000
June	400,200	2,700	845,000
July	473,100	117,200	789,900
August	520,800	434,100	709,200
September	555,900	429,300	884,700
October	.....	405,400	544,300
November	.....	443,800	505,100
December	.....	381,100	746,600

Win and Lose Bridge Jobs

New York, Oct. 24.—In competition with French, German, British and Belgian fabricators, the United States Steel Products Co. has been awarded contract for 3000 tons of bridge material for the Santa Lucia bridge in Uruguay. At the same time it has been announced that a British fabricator underbid the lowest American figure by $10 a ton on 10,000 tons of bridge work for the East Indian state railways and has been given the contract.

Rise of Farm Products Important

Grain, Livestock and Cotton Advance—Wheat 10 Per Cent, Corn 40 Per Cent Over 1921—Cotton at Year's high—Reflects Foreign demand—Farmers Buying Power Enhanced—German Marks Near Repudiation

BY JOHN W. HILL, FINANCIAL EDITOR

THE most important recent development in the domestic business situation has been the rise in virtually all classes of farm products. Grain prices have advanced from 10 to 18 per cent this month. Wheat is now about 10 per cent higher than it was one year ago, while corn and oats are from 40 to 50 per cent higher. Cotton is now at the highest level of the year. Save in the case of cotton, these increases have occured in the face of large production this year.

Not only is large domestic consuming power indicated, but the higher values reflect the large foreign demand from abroad. Europe's food production this year is less than it was last year and below normal requirements. This means large purchases from exporting nations, of which the United States is one.

Better prices for farm products is of great significance for domestic business. Farms comprise nearly 50 per cent of the country's consumers. If their purchasing ability is restricted or depleted, all business must suffer. For that reason the better purchasing power for the farmers will serve partly to offset the reduced buying ability of Europe caused by the current decline in marks, francs and lire. German currency is at the verge of complete extinction. Paper inflation has been carried to its logical conclusion. In 1914 there were 1,891,000,000 marks in circulation, with a purchasing power of equal amount. On Oct. 14 there were 376,000,000,000 marks in print, with an internal purchasing power on the prewar basis of only 717,000,000 marks.

For some months there has been a growing use of stable foreign currencies in Germany. Either the mark will become wholly supplanted by this means, or a new German currency will be created. This latter is now being discussed in Berlin. Complete oblivion for the mark will mean losses for holders but it should not mean a financial or economic collapse for Europe. Business reaction in Germany from the "inflation" boom is to be expected, however.

French currency has been falling rapidly in the last week. This is due to the huge financial burdens of the French government, together with the failure or inability of Germany to pay reparations. France has proposed a plan of German financial control, which is now being considered by the reparations commission. She is unwilling to agree to reparations reduction while inter-allied debts are left intact. Secretary Herbert Hoover has made the administration's policy clear on the point that it will insist upon collection of the $10,000,000,000 loaned to Europe during the war. England has indicated her intention to pay.

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Steel Output Per Capita	June 8
Dollar Purchasing Power	May 4
112 Years of Prices	March 30

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	442	390	410	407	356
Cash Ratio Fed. Res. System.	75.2	75.7	78.3	70.3	.....
Loan rate, 4-6 months, N. Y. (per cent)...	4¼-4½	4¼-4½	4¼-4½	5½-5¾	5½-6
Aver. 20 Ind'l. shares	$97.19	$98.33	$94.71	$68.16	$78.51
Aver. 20 Rail shares	$93.09	$92.46	$91.19	$71.26	$104.71
Aver. 40 bonds	$80.62	$81.15	$82.44	$71.99	$93.00
Car loadings (week ended Oct. 7).....	968,169	988,381	823,844	899,681	*1,011,666
Bank debits 165 cities (000 omitted)	$9,865,022	$9,319,046	$9,413,946	$9,145,010	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	Oct. 23 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.44	$4.43⅝	$4.41	$3.93
Francs	19.3c	7.12½c	7.52½c	7.56c	7.27c
Lira	19.3c	4.11½c	4.19½c	4.16½c	3.94c
Marks	23.8c	0.02 1/16c	0.03 7/16c	0.07c	0.62c

MONTHLY COMPARISON

	September	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$271,493,000	$322,007,000	$246,186,000	$71,450,000
Business failures:				
Number	1566	1714	1446	1336
Liabilities	$36,909,157	$40,279,718	$37,021,000	$22,723,000
Excess of exports	$85,000,000	$31,000,000	$146,490,953	$54,406,000
Excess of gold imports	$27,602,000	$18,136,355	$63,636,512	*$630,716
Bureau of Labor Price Index....	153	155	141	100
Bradstreet's Price Index	155.6	154.5	164.8	100
Economist's British Price Index....	4189	4257	4924	2717
Cost of Living Index	155.6	154.5	164.8	100
New incorporations	$664,000,000	$646,605,000	$498,846,000	$172,301,000
Railroad net earnings	†$53,000,000	$69,239,000	$90,240,000	$59,900,000

†August. *Monthly average export excess.

The Business Trend

October 26, 1922

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—All important domestic factors indicate immediate trend of rising prices and expanding business activities; upturn of farm products values encouraging; rising wages and labor shortages unfavorable; commercial bank loans increase but credit resources enormous.

INDUSTRIAL ACTIVITIES—Despite car shortage iron and steel output has gained in recent weeks; automobile production and building in seasonal decline.

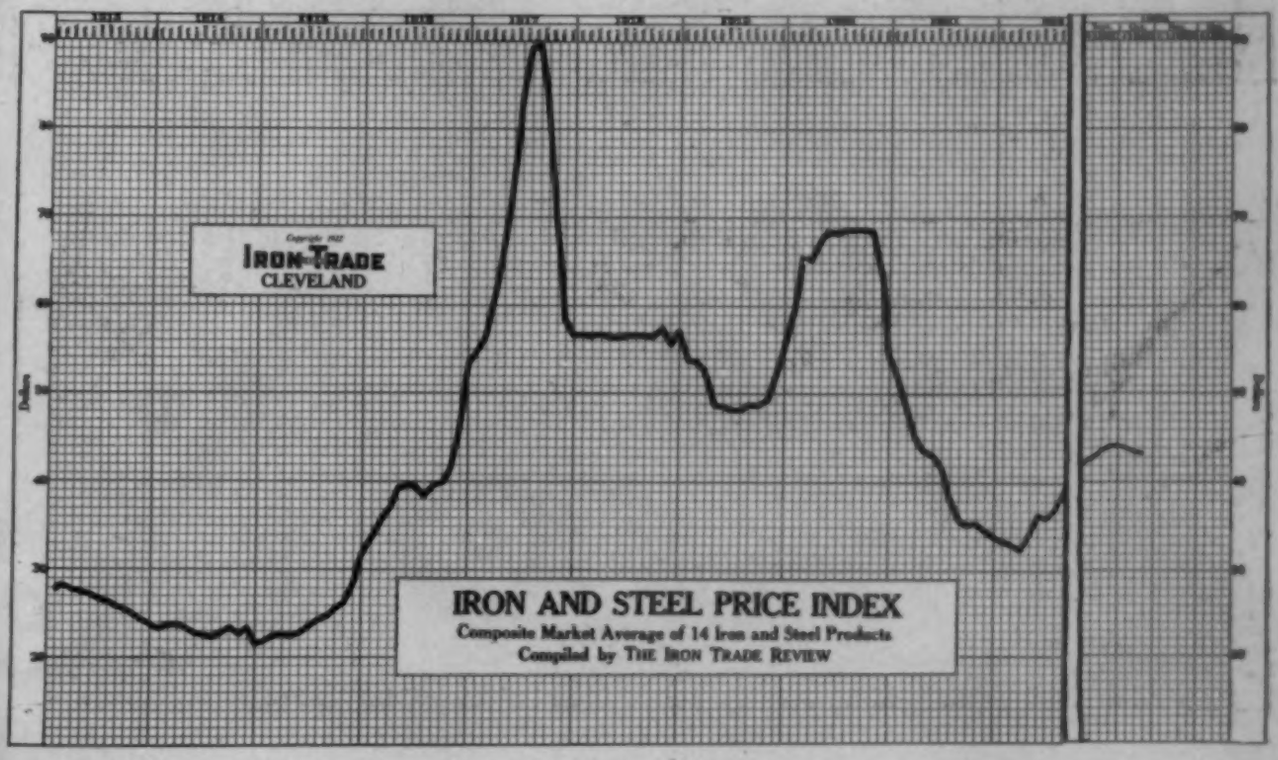
FREIGHT SITUATION — New Business Trend chart pictures growing car shortage; car loadings declined in week ended Oct. 7 due to congestion; no relief in sight.

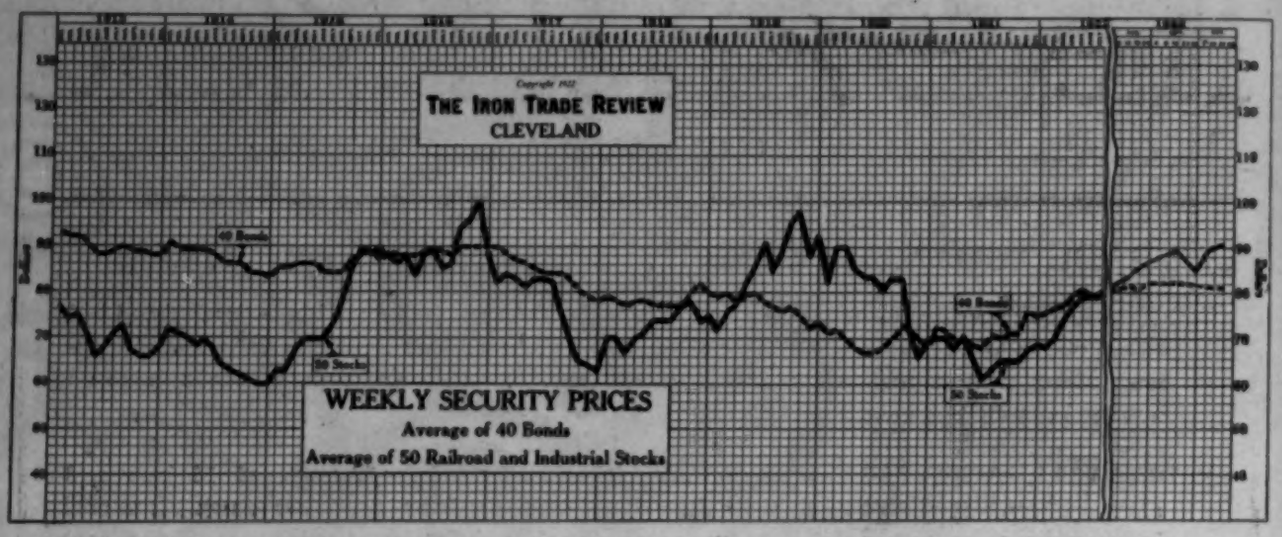
SECURITIES—Trend of 50 representative stocks still upward; easy money and good trade prospects sustain rise; bond advance ends as banks sell to get liquid funds for commerce.

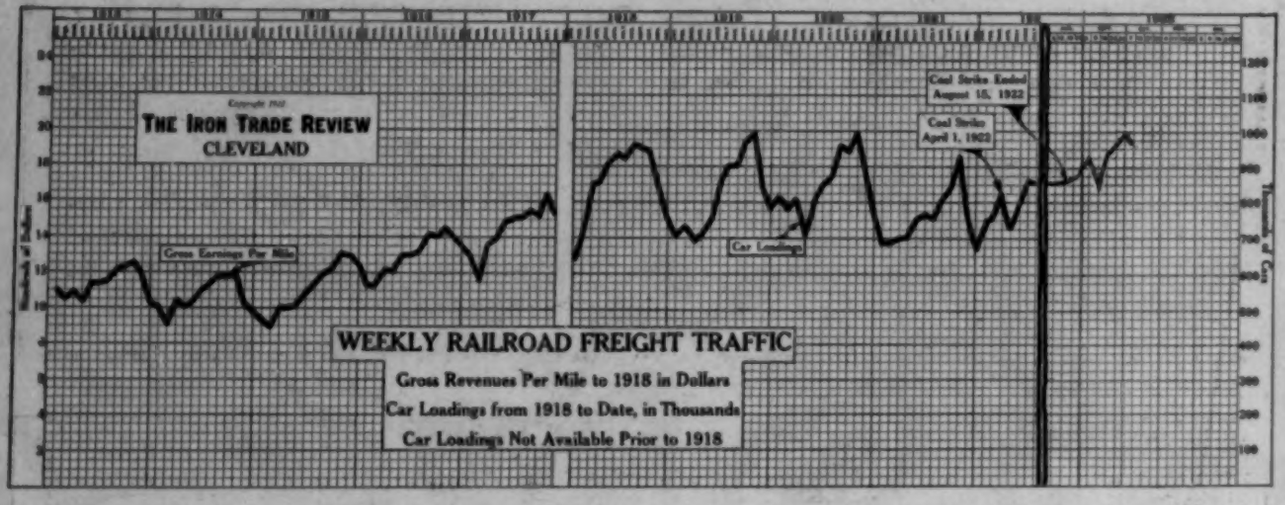
STEEL PRICES—Average of 14 iron and steel products continues down after coal strike inflation; level now 65 per cent above 1913; was 25 per cent above in March.

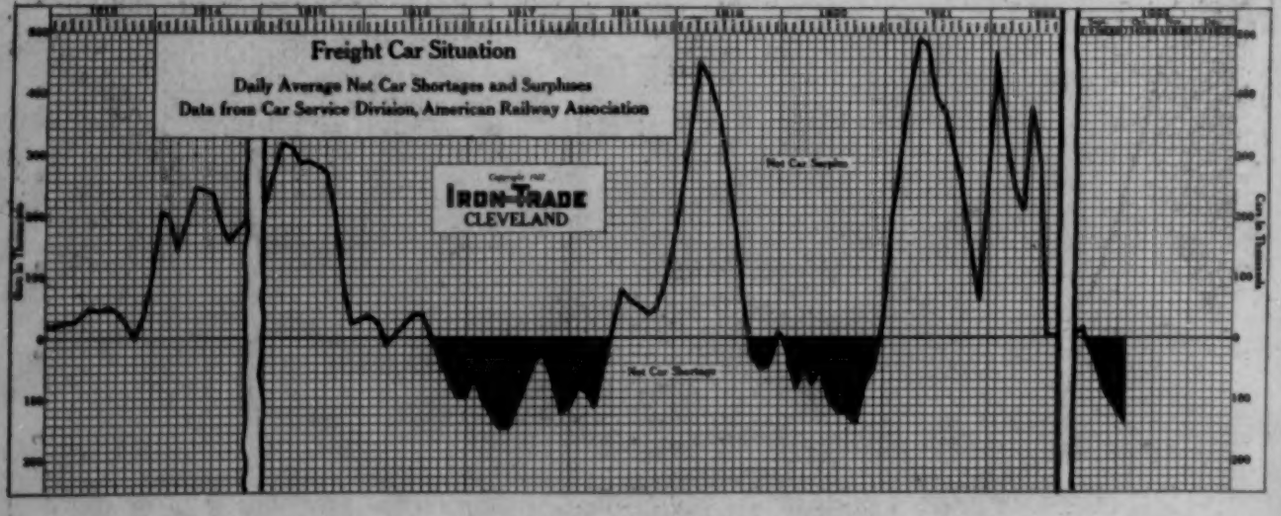
SHEET SITUATION—Demand large as production is checked by freight congestion; stocks pile up; September sales 75 per cent of capacity against 67 per cent in August.

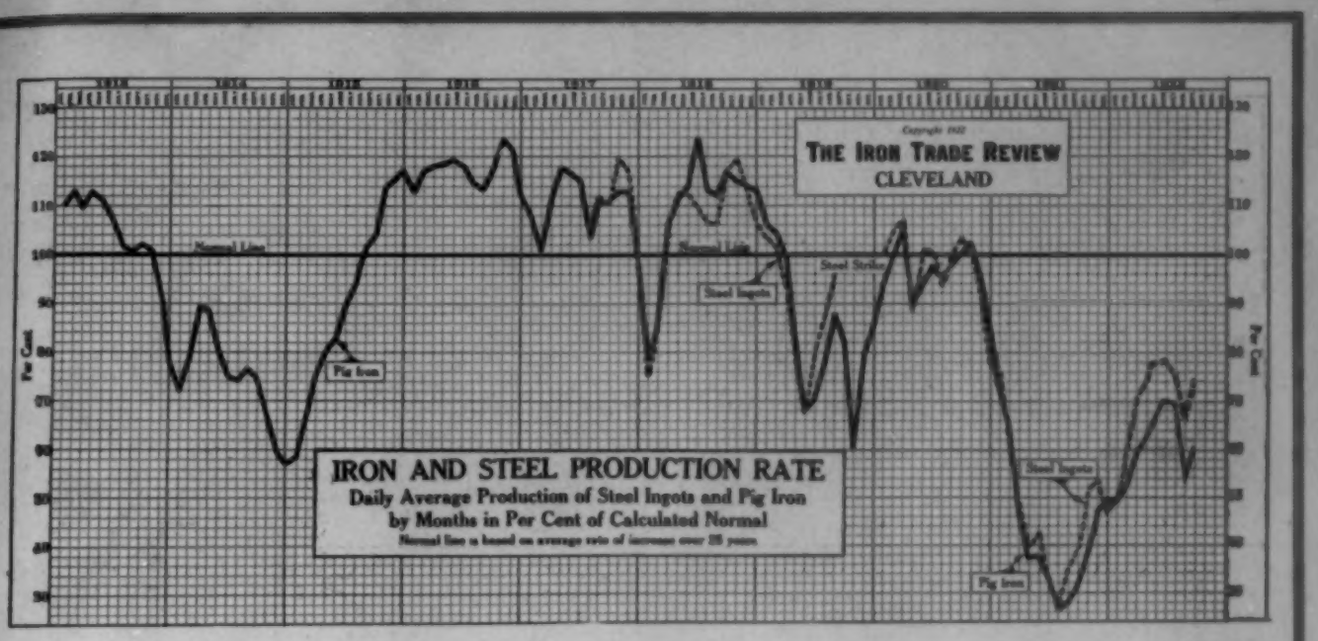
PRICES AND FAILURES—As business improves and prices rise, the number of failures declines; chart discloses present encouraging trend of these factors.

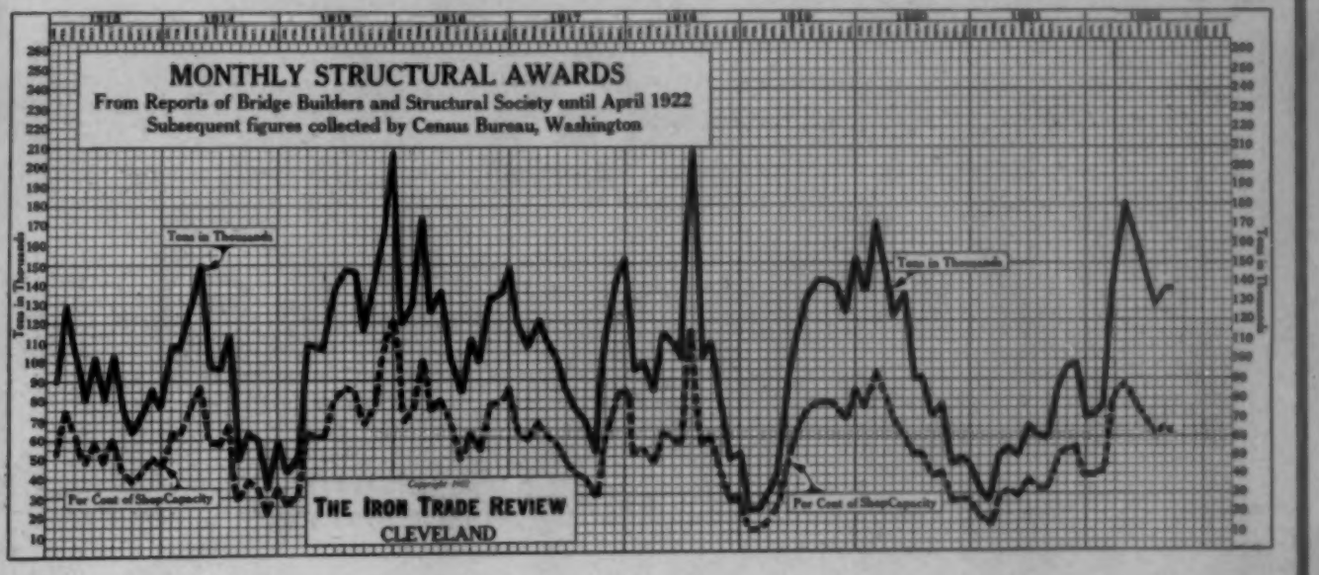

IRON TRADE
CLEVELAND
IRON AND STEEL PRICE INDEX
Composite Market Average of 14 Iron and Steel Products
Compiled by THE IRON TRADE REVIEW

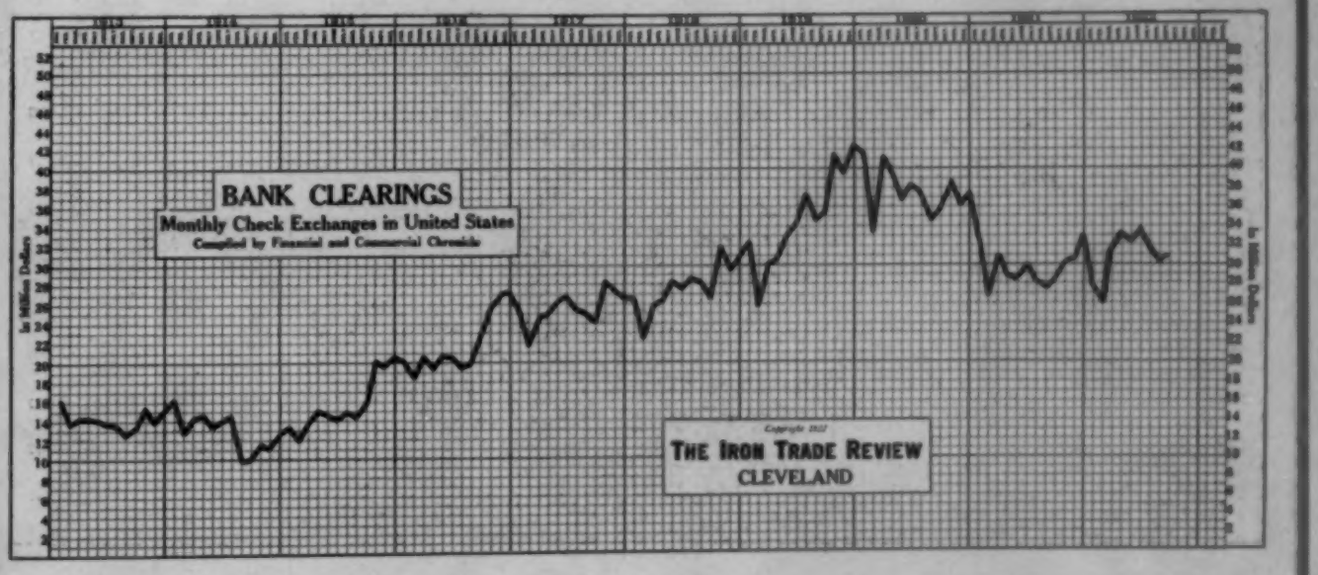

THE IRON TRADE REVIEW
CLEVELAND
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks


THE IRON TRADE REVIEW
CLEVELAND
Coal Strike Ended August 15, 1922
Coal Strike April 1, 1923
Gross Earnings Per Mile
Car Loadings
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918


Freight Car Situation
Daily Average Net Car Shortages and Surpluses
Data from Car Service Division, American Railway Association
IRON TRADE
CLEVELAND
Net Car Surplus
Net Car Shortage


THE IRON TRADE REVIEW
CLEVELAND
IRON AND STEEL PRODUCTION RATE
Daily Average Production of Steel Ingots and Pig Iron
by Months in Per Cent of Calculated Normal
Normal line is based on average rate of increase over 28 years
Normal Line
Pig Iron
Steel Ingots
Steel Strike
Per Cent


MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society until April 1922
Subsequent figures collected by Census Bureau, Washington
Tons in Thousands
Per Cent of Shop Capacity
THE IRON TRADE REVIEW
CLEVELAND


BANK CLEARINGS
Monthly Check Exchanges in United States
Compiled by Financial and Commercial Chronicle
In Million Dollars
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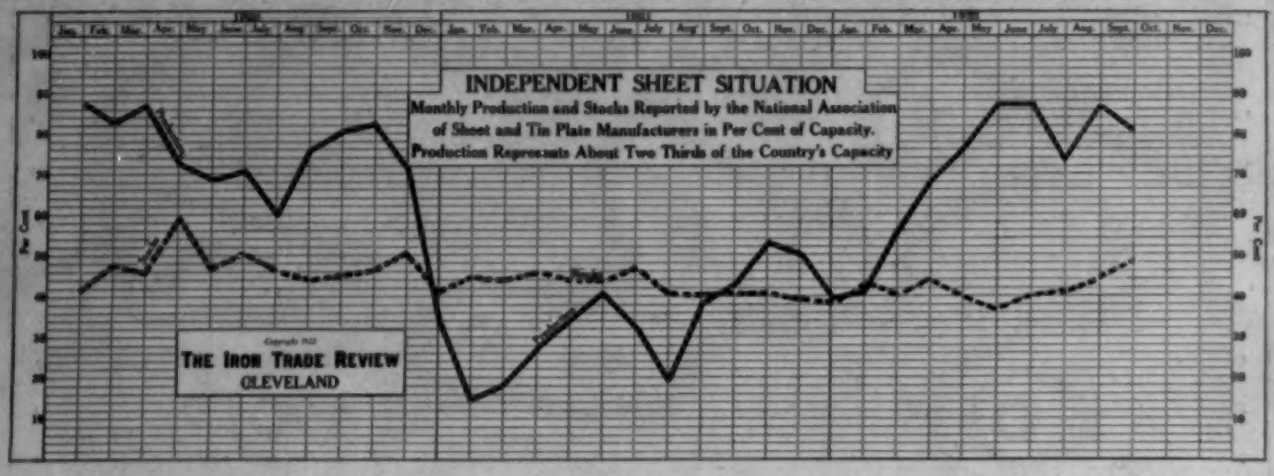
INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by the National Association of Sheet and Tin Plate Manufacturers in Per Cent of Capacity.
Production Represents About Two Thirds of the Country's Capacity
Per Cent
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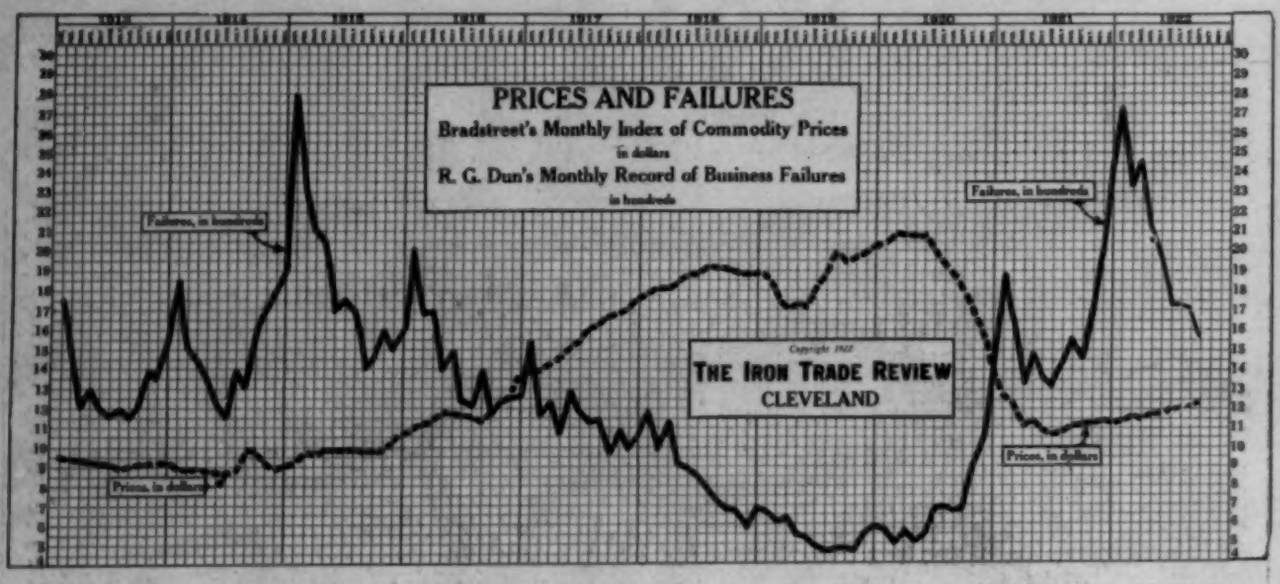
PRICES AND FAILURES
Bradstreet's Monthly Index of Commodity Prices
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R. G. Dun's Monthly Record of Business Failures
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Failures, in hundreds
Prices, in dollars
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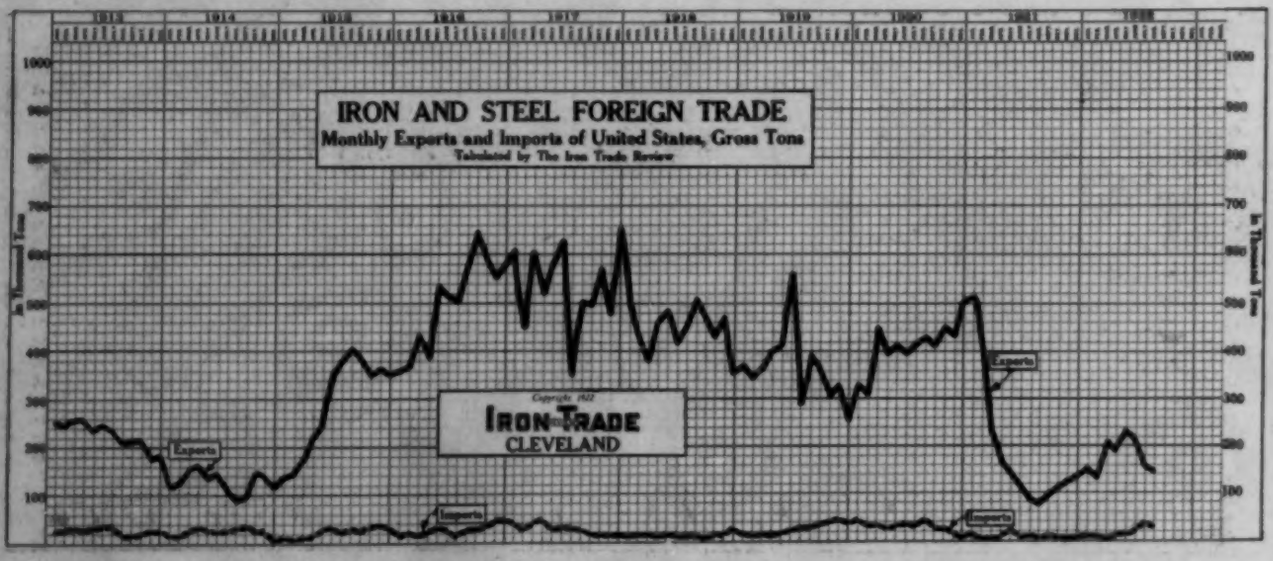
IRON AND STEEL FOREIGN TRADE
Monthly Exports and Imports of United States, Gross Tons
Tabulated by The Iron Trade Review
In Thousand Tons
Exports
Imports
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Carrying Iron Ore to Ford Furnaces

Shippers Lightering Half Million Tons up River Rouge—Mechanical Equipment Facilitates Transfer from Lake Vessels to Barges

BY A. J. HAIN

ORE IS TAKEN FROM LAKE VESSELS IN THE DETROIT RIVER, DUMPED INTO HOPPERS, FED ONTO A BELT CONVEYOR AND INTO SMALL BARGES, FOR SHIPMENT UP THE RIVER ROUGE

WHEN the Ford Motor Co. last spring asked shippers of Lake Superior iron ore for prices on 550,000 tons of ore to be delivered by waterway to its blast furnace plant on River Rouge near Detroit it presented an unusual problem in transportation. The problem has been solved and the Ford plant is receiving the ore; also 200,000 tons of limestone—all by water.

The difficulties encountered by the shippers will be understood if it is recalled that the furnace plant is located inland about 4½ miles from the Detroit river on a stream too shallow for the passage of lake vessels engaged in the ore trade. This has compelled the shippers to convey all the material upstream in small barges and steamers, loading these from large lake vessels in the Detroit river. One of the shippers, Clement K. Quinn & Co., found it necessary to install on the river dock a specially devised ore conveyor to take the ore from lake vessels and place it in the shallow-draft barges and steamers. A temporary expedient is working out successfully; as a permanent arrangement it would not be practicable from the standpoint of time or expense.

Next year it is expected the dredging, straightening and improving of the Rouge will have been completed, and the largest lake vessels will be delivering materials to the dock of the Ford plant, this in itself constituting an important industrial enterprise.

The patience and resourcefulness of the shippers were taxed this year because Henry Ford had a vision of a great industrial community, apparently indifferent to time, labor and expense involved in bringing in the lanes of traffic.

But more directly related to the problem is the fact that the plant managers had other use this year for their limited railroad terminal facilities. Last year, and previously, iron ore was hauled in from the dock of the Hanna Furnace Co., on the Detroit river, over a short connecting railroad. This year, however, the Ford company decided early in the spring that it could not congest its lines with ore and limestone; these had to be brought in by water.

When the company issued its inquiries for ore, it started a line of other inquiries. These were from the ore shippers and were directed to the United States engineer's office. They wanted specific information in regard to the Rouge, its depth, width, number of bridges, and so on. The limiting depth was found to be 11 feet, width of vessel's beam, 34 feet; width of stream, 160 to 200 feet, and number of bridges, nine. These figures indicated that even the smallest lake vessels in the ore trade could not deliver their cargoes to the Ford dock.

It was generally presumed that M. A. Hanna & Co. would be enabled to take the tonnage from the dock

of its associated company, the Hanna Furnace Co., and move it to the Ford plant by rail as usual. No other dock space appeared available. Approximately half the ore tonnage was awarded to M. A. Hanna & Co., and the remainder to Clement K. Quinn & Co. The Quinn company had neither dock facilities nor boats of its own with which to do the lightering, but the ore is moving along as bargained for, from the Hanna and Quinn companies. It is understood in both cases that the ore was sold on the basis of delivery to the Detroit river dock, to which, of course, must be added the expense of moving ore to the Ford plant.

When the contracts were placed there was a co-operative movement of ore and limestone interests to deliver the material. The Ford company had started to operate the Steamer HAUSSLER, 900 tons capacity, to carry limestone from the dock of the Solvay Process Co., on the Detroit river, where it was deposited by the company that has the contract to supply the material. The HAUSSLER became the nucleus of a fleet of five or more boats now delivering ore and limestone, all of them operated by the limestone company.

The Solvay Process Co.'s dock is located at the north juncture of the Detroit river and the Rouge, while the Hanna Furnace Co.'s dock is at the south juncture. On the south side the unloading of Hanna ore from lake vessels and loading of the lighters is a simple operation. On the Solvay side from whence is taken the Quinn ore, it is different. The space available is more limited and practically all of it is taken up with stockpiles of limestone. That leaves the Quinn ore to be taken from the lake vessel, conveyed over a narrow strip of the dock at the water's edge and loaded on to a barge, lying end to end with the lake vessel. In this operation the ore is fed from the lake vessel to a belt conveyor and thence into a barge, pouring into this in a continuous stream. The ore does not touch the dock at any stage of the operation.

Equipment in Use

The limestone company has as permanent equipment on the dock two 90-ton electric gantry cranes made by the Orton & Steinbrenner Co., Huntington, Ind. These have 65-foot booms, handling 2½ yard buckets. The bucket hoisting speed is 160-feet per minute, the turning speed of the cranes, two revolutions per minute, the operating cycle, 60 seconds, and the average capacity is 220 tons per hour, digging from the boat.

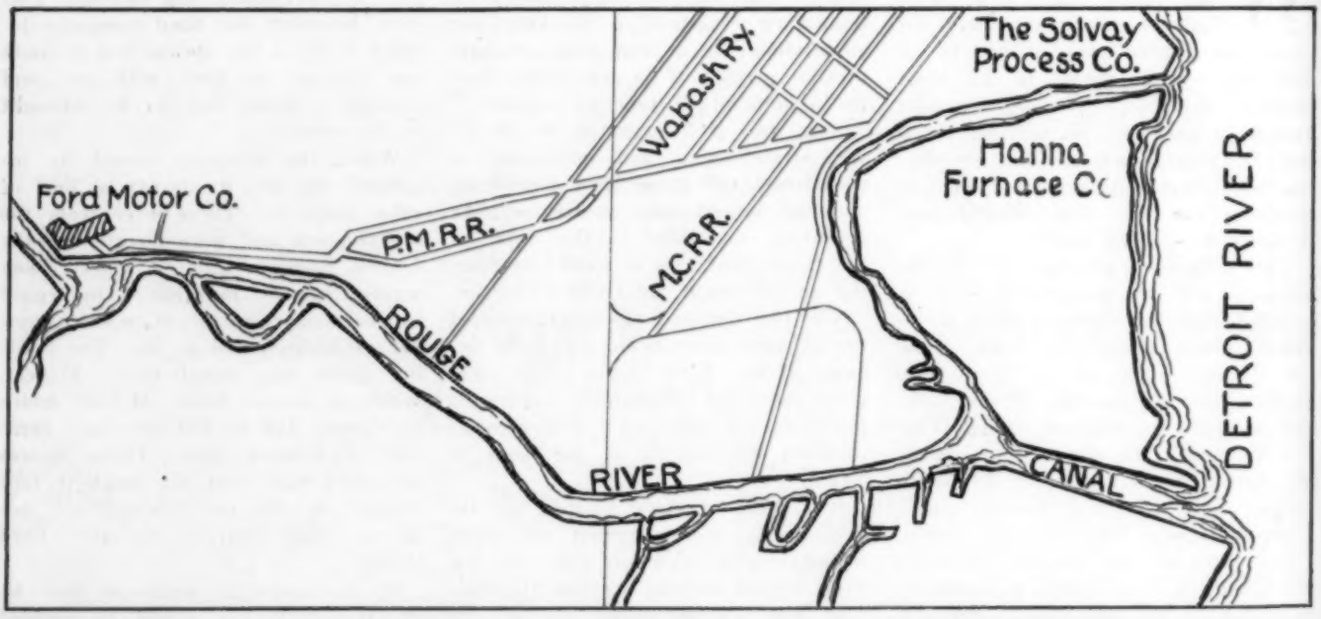
The special dock machinery for handling the ore consists of a 600-foot conveyor belt, 24 inches wide, running the full length of the dock. It passes beneath two traveling hoppers with belt feeders, into which the gantry cranes dump the ore. The iron ore runs the length of the dock on the conveyor belt, which inclines upward at the end, at an angle of about 18 degrees, and when the ore is so elevated to a height of about 18 feet it is discharged on to a 24-inch shuttle belt running at right angles to the main conveyor. This shuttle belt reciprocates back and forth on a structure 22 feet above the water. The shuttle permits the operator to feed the ore into a barge with uniform distribution, enabling him to trim the cargo.

The capacity of the belt system is 550 net tons of iron ore per hour running at a belt speed of 460 feet per minute. The main conveyor belt is driven by a 50-horsepower motor and the shuttle belt by a 10-horsepower motor. The reciprocating shuttle structure is actuated by a 5-horsepower motor with suitable speed reducers and cable drums. The dock belt machinery was furnished by the Robbins Conveying Belt Co., Chicago. The hopper feeders have an electrically-driven traveling mechanism, chains and sprockets furnished by the Baldwin Chain & Mfg. Co., Worcester, Mass.

The lake freighter with its cargo of ore is drawn up alongside the gantry cranes. A barge is also drawn up, end to end, with the barge at the freighter's stern. The crane equipment is not large enough to load from the freighter directly into the barge.

The Quinn ore is brought down from the Northwest in vessels of 5000 to 7000 tons capacity which are unloaded in 30 to 58 hours, depending on size and structural conditions. Generally during the first 10 hours the material can be handled at a rate of 400 tons per hour, but after that the rate slows down somewhat due to the large amount of cleanup labor necessary with certain types of boats and with the unloading apparatus in use.

At the Hanna Furnace Co.'s dock the ore is received in 10,000 ton freighters which are unloaded in about 26 hours by hoisting rigs made by the Brown Hoisting Machinery Co., Cleveland. The material is either put on the dock and



LOCATION OF THE FORD MOTOR CO.'S RIVER ROUGE BLAST FURNACE PLANT, IN RELATION TO DETROIT RIVER. THE CANAL WILL REDUCE THE DISTANCE FROM THE DETROIT RIVER TO THE PLANT FOR THE LAKE STEAMERS BRINGING RAW MATERIALS TO THE PLANT

rehandled into barges later or loaded direct through a traveling hopper onto a conveyor belt and delivered by chute into a barge underneath. Limestone is loaded directly into barges from self-unloading boats, or material can be taken from the stockpiles of the Solvay dock and loaded into barges by means of the gantry cranes.

The lightering units include the Steamers HAUSSLER, 900 tons capacity and TRENTON, 600 tons; barges INTERSTATE, 550 tons; TILDEN, 500 tons, and JONES, 500 tons. These five combined have a theoretical capacity of 12,220 tons in 24 hours, but allowing for delays this is reduced to 8000 tons in actual practice. They work on a cycle of about seven hours; one and one-half hours to go up the river, two hours to unload, one and one-half hours to return and two hours to load.

At the Ford plant is one of the largest and best equipped docks on the Great Lakes for the handling and storage of raw materials for blast furnace use. On either side of the Rouge, here greatly widened are concrete walls, 5000 feet long. The dock proper is built of concrete, with storage bins for 1,000,000 tons of iron ore and limestone. The handling equipment at present consists of two Hulett unloaders of the latest type and one Brown hoisting cable rig. The river has been dredged at this point to accommodate the largest lake freighters. The dock was built several years before the Ford company could have expected to make the fullest use of it.

About $5,000,000 is being expended by various agencies in making the River Rouge navigable for lake freighters. Congress in 1917 appropriated $490,000 for dredging the river, and last winter voted an additional $100,000. The Ford company purchased land along the river to widen it, the amount of this expenditure being variously estimated at $500,000 to $600,000. This was conditional on the government's appropriation for dredging the river. Bridges, private and public, are costing about $3,000,000, and the relaying of pipes about $50,000.

Reference to the accompanying map will show where the government has built a short-cut canal from the Detroit river to the Rouge. This canal is 2000 feet long, is 400 feet wide at the Detroit river and narrows to 200 feet where it joins the Rouge. Further up the Rouge another "elbow" or bend is eliminated by a direct cut through what was marshland. These alterations reduce the distance from the Detroit river to the Ford plant from 4½ to about 3½ miles. A dozen or more companies, handling salt, lumber, coal and oil have property between the Detroit river and the Ford plant and will be benefited to a considerable extent by the improvement, though the Ford company is the largest interest, and adequate water transportation is essential to the operation of its furnace. It is served by the Michigan Central, Wabash, Pere Marquette and Detroit, Toledo and Ironton railroads, but water conveyance is necessary for its iron ore.

The government has dredged the Rouge to make the bottom 200 feet wide and the surface 300 feet wide, with a maximum depth of 21 feet, except at bridges and also in the old channel to be relegated by the new canal. Two public bridges at Fort street will be replaced by one, a new public bridge will be built at Jefferson avenue, while the Dix avenue bridge, public, will be retained. Three other bridges will be built by railway interests. Thus there will be six bridges crossing the Rouge between the Detroit river and the Ford plant. All will be of the bascule type. The minimum width at the bridges will be 125 feet. It is expected that the bridges will be completed by spring and the dredging by summer, 1923.

The enterprise is of great significance to Detroit, certain to extend its industrial interests. A review of what is in progress on the American side, a glance across the Detroit river directly opposite to where the Canadian Steel Corp., Ltd., is building the Ojibway steelworks—on one side Ford and on the other the interests of the United States Steel Corp.—leaves little to the imagination as to what the genius of modern industry is to reveal in a little while. Meantime the improvised ore handling equipment on the Solvay dock, and the little barges with their small cargoes—all are playing their part and are indications of what is to come.

Revises Pamphlet on Pig Iron Analyses

Inasmuch as the methods for sampling and analyzing pig iron have undergone considerable change since 1912 when the Carnegie Steel Co. published its pamphlet entitled "Methods of the Chemists of the United States Steel Corp. for the Sampling and Analysis of Pig Iron," a committee chosen from the chemists employed by the various subsidiary companies of the corporation recently has revised and rewritten the pamphlet. The first six pages are devoted to the sampling of iron. Two forms of molds are recommended for taking samples of pig iron in the molten state and these are illustrated with dimensions. The accuracy and care in taking the sample, the number of samples to be taken so as to obtain a reliable chemical analysis and the preparation of the test pieces are discussed at length. In addition to the methods for the determination of silicon, sulphur, phosphorus, manganese, titanium, copper and total and graphitic carbon the solutions required and the method of preparing them are given in detail. The combustion apparatus for the determination of carbon is perhaps one of the most compact yet devised. The equipment consists essentially of an oxygen tank, pressure reducing and regulating valves, a purifying bottle, combustion apparatus, drying tube, absorption bottle and an indicator bottle. An illustration of the equipment in the assembled state accompanies the text. The pamphlet while prepared for chemists of the steel corporation can be purchased by outside sources from the Carnegie Steel Co., bureau of technical instruction, Pittsburgh.

Experiment on Reheating Compressed Air

"The Reheating of Compressed Air," by C. R. Richards and J. N. Veddor, is the title of bulletin No. 130, just issued by the engineering experiment station of the University of Illinois. The investigation leading to the publication was undertaken to determine ideal thermodynamic efficiencies resulting from heat expended in the reheating process, the efficiency of external and internal combustion reheaters and the performance of an engine operated with air used expansively with steam alone and with a mixture of air and steam.

Use of compressed air in the transmission of power has increased rapidly in the last few years. The ease and economy with which the air may be transmitted long distances, and the large number of air motors and tools now on the market have led to the extensive use of compressed air for mining, quarrying and tunneling, and in various shop processes. In the smaller type of air-motors and tools operated by compressed air and used intermittently, it is not the general rule to use the air expansively, economy of operation being sacrificed for simplicity and minimum cost of initial installation. Where air motors are run continuously for any great period of time the economy of operation is an important factor and in some cases the air should be expanded in the motor. Since the temperature of the air normally would be little if any above atmospheric after expansion, the tempera-

ture would be so low as to cause serious difficulties both from the freezing of the moisture in the air and from interference with lubrication.

The difficulty can be overcome by heating the air before entering the motor to such a temperature that the expanded air will have a temperature above the freezing point of water.

Studies Dipped Malleable Iron Casting Quality

For many years producers of malleable iron have been the targets for complaints from users of malleable castings which have been hot dip galvanized. Although the original castings are of good quality, after galvanizing they are frequently found to be brittle, and the manufacturer is credited with making an inferior grade of metal. Most producers of malleable castings appreciate this situation and will assume no responsibility for the breakage of castings after they have been galvanized.

The Eastern Malleable Iron Co., Naugatuck, Conn., a large producer of galvanized malleable iron castings has devoted much attention to this subject during the last two years. Through experimentation and investigation of its research department, this company believes it has effected a solution and is in a position to guarantee castings against crystallization due to galvanizing providing that the galvanizing is done in the generally accepted manner. Not so much difficulty has been experienced by crystallization of tinning malleable iron castings although it does occur sometimes, but the same method used to overcome the trouble in galvanizing applies to tinning as well. As the overcoming of this difficulty will assist in widening the field for hot dipped malleable castings, the Eastern Malleable Iron Co. will give full information to those desiring it.

Suggests Analyses of Iron and Steel

BY PAUL V. KLINE

THE following methods for the determination of the quantity of phosphorus and manganese in iron and steel have been found by the author to be short and to give accurate results. The formation of the pure ammonium phosphomolybdate with a constant composition is possible only under certain closely controlled conditions. Therefore, it is necessary for a chemist to ascertain for himself by repeated experiments what these conditions are and to standardize the solutions and make the determinations under exactly the same conditions each time.

Weigh 1 gram of finely divided drillings and transfer them to a 100 cubic centimeter bates sugar flask and add about 50 cubic centimeters of dilute nitric (323 cubic centimeters of nitric to 1677 cubic centimeters of water). Set the flask on the hot plate and heat until the drillings are in solution and the brown fumes expelled. Set the flask aside or cool under the tap until it reaches room temperature. Then carefully dilute to mark and filter through a dry filter. Now pipette off 50 cubic centimeters of the filtrated filter into a 300 cubic centimeter erlenmeyer flask. This will represent 0.5 gram of the sample to be used for the phosphorus determination. Next pipette off 25 cubic centimeters of the filtrate into a 200 cubic centimeter beaker to be used for the manganese determination. This, of course, represents 0.25 gram of the sample.

Phosphorus—Set the flask containing the 50 cubic centimeter sample on the hot plate and allow the solution to come to a boil. Then add enough potassium permanganate solution (10 grams of potassium permanganate per 100 cubic centimeters of water) until a chocolate precipitate is formed. It usually takes about 2 cubic centimeters of the permanganate solution to do this. Now destroy the brownish precipitate with a ferrous sulphate solution (50 grams of ferrous sulphate in 500 cubic centimeters of water and a few drops of sulphuric acid). A few drops of this solution is all that is necessary and gives the solution in the erlenmeyer flask a greenish cast. Bring the solution to the temperature of the hand and add 15 to 20 cubic centimeters of ammonium-molybdate solution (130 grams of molybdic acid thoroughly mixed with 284 cubic centimeters of distilled water and 286 cubic centimeters of ammonium hydroxide, specific gravity 0.90, added when solution is complete. This is poured with constant stirring into a mixture of 670 cubic centimeters of nitric acid and 760-cubic centimeters of water). Shake vigorously to bring down the yellow precipitate. Allow the yellow precipitate to settle only a few minutes otherwise it will stick to the sides of the flask making it difficult to wash onto the filter paper. Carefully filter and wash with 1 per cent potassium nitrate solution until the flask and paper are free of acid. Transfer the paper into the original erlenmeyer flask add 25 cubic centimeters of water and a few drops of phenolphtalene indicator and a measured excess of N/10 sodium hydroxide solution. Insert the stopper and shake vigorously until the yellow precipitate is dissolved, remove the stopper and wash the stopper and sides of the flask with distilled water. Titrate with N/10 nitric acid. Titrate the acid and the alkali against each other and also against a standard sample.

The calculation of results is as follows:

W=Weight of phosphorus in 0.5 grams of standard sample used.

A=The cubic centimeters of alkali used.

B=The cubic centimeters of acid used to back the titrate.

R=The ratio between the alkali and acid as found by titrating one against the other.

$$R = \frac{\text{c.c. of alkali}}{\text{c.c. of acid}}$$

Amount of phosphorus per cubic centimeter of N/10 alkali $= \frac{W}{A - B \times R}$

Amount of phosphorus in any sample $=(A-B\times R)\times$(amount of phosphorus per cubic centimeter N/10 alkali)$\times 2$.

On low phosphorus determinations greater accuracy is obtained by using acid and alkali titrating solutions of N/20 strength.

Manganese—The 25 cubic centimeter portion is placed on the hot plate after adding 15 cubic centimeters of silver nitrate solution (5 grams of silver nitrate to a mixture of 400 cubic centimeters nitrc acid and 600 cubic centimeters of distilled water). Heat to incipient boiling. Then add 15 cubic centimeters of ammonium persulphate solution (140 grams of ammonium persulphate dissolved in 1000 cubic centimeters of water). Continue heating for a half minute after oxidation begins and bubbles arise freely. Set aside or cool under tap until it reaches room temperature. Titrate with standard sodium arsenite to the loss of the permanganate color. By adding 10 cubic centimeters of sodium chloride solution (5 grams of sodium chloride in 500 cubic centimeters of water) aids in obtaining a distinct end point.

To find a factor for the sodium arsenite solution calculate from the cubic centimeters necessary to destroy the pink color on a 0.25 gram sample of a standard iron or steel.

Organizing for Taking Inventory

Modern Methods of Accounting Make Physical Inventories Unnecessary Except for Determining Accuracy of Accounting Procedure—Best To Create Temporary Organization of Department Heads—Counting and Checking Started in Advance

BY O. C. KIEHNE

PRIOR to general appreciation of cost systems, when accounting procedure consisted of clearing practically all operating and trading transactions through the merchandise account; and the manager of a company was satisfied to wait 12 months for information as to the profits or losses incurred during a year's activity, the general practice of taking inventories was to close down the plant for several weeks during the season when business usually slackened. This being the end of the calender year, was the time when salesmen would be called in for the holiday season and the salaried personnel notified that an inventory would be taken, starting the next morning.

During those days inventories were looked upon as a necessary evil to be disposed of along lines of least resistance. Responsibility was passed from one person to another until a few foremen, clerks and office boys were the only ones left to assume it. Little or no instructions were given or preparation made from either an accounting or a production point of view. It could not be easily proved whether all items were salable or whether the valuations placed upon them represented any relation to current prices, as in many instances this important function was left to a file clerk, whose only responsibility was to search the files of the organization for an invoice corresponding to the material, and of course such invoices may not have been the latest ones. If any ommissions or duplications occurred in the taking of the inventory, the discrepancy often was undetected, and in many cases where material was received immediately prior to the closing of the period and the invoice dating did not require payment for 30 or 60 days hence, the inclusion of such items simply showed up as additional profit. Purchases were not charged until cash was credited.

Cash Invested in Material

Materials usually were stored in vacant places, with little consideration given to convenience in handling or protection against loss by deterioration or otherwise, and yet, if a stray penny remained unprotected in the cashier's office, the offense was sufficient to warrant his dismissal. Does it not seem strange that even today a dollar in cash appears so vastly different from a dollar represented by material for which cash was paid, and that in many cases if the accounting for material was half as rigid as accounting for the petty cash, many a sherift would have fewer sales to his credit?

However, we have progressed from bookkeeping to accounting, and by accounting we mean all that the word implies. Physical inventories need not be taken under present accounting procedure for the sole purpose of determining the profit or loss of the period, or to effect an annual renovation of the factory and storerooms. They are taken to prove the results as shown by the general books of account, and it is advisable to take a physical inventory at least annually for the purpose of determining the accuracy of the accounting procedure. This essential is not only required by the management of a company, but under present day practices of industrial expansion, credit extension and federal income requirements, it is absolutely essential that physical inventories be taken. The comments of an audit report and the inventory certification blank required in connection with income tax returns, positively certifies the inventory and explicitly states the conditions under which the same has been taken and proved correct.

When speaking of physical inventories we could of course interpret this to include all items of invested values of properties, but under present day methods, such items of permanent investment as machinery equipment, tools, fixtures etc., are covered, but by scientifically making allowance for the portion lost through depreciation and obsolescence. A physical check is not often required, except in cases of revaluation or special appraisals. Therefore consideration will be given only to that part usually known as the merchandise inventory. This consists of all raw materials and parts that are used in the manufacture of the product, and such miscellaneous items of operating supplies as are carried under general stores.

Several distinct points should be considered in connection with taking an inventory. These are as follows and are taken up consecutively: 1. Advance planning and preparation; 2. physical count, check and summary; 3. valuation.

Under advance planning and preparation, many irregularities that otherwise develop at the eleventh hour can be anticipated and disposed of prior to the time of physical count and check. If it is desired to take the inventory with a view of minimizing the closing of the plant, each person entrusted with any part of the work must be instructed properly previous to the closing period. It has been found unsatisfactory to place the responsibility for planning and supervising the work upon one person, and in most plants it is now standard practice to create a temporary organization composed of department heads for planning the physical preparation of the plan and later supervising and directing the execution of the work. Such an organization should include such persons as the general manager as chairman, auditor, chief engineer, superintendent, production control supervisor, cost accountant, general storekeeper, chief inspector and purchasing agent.

Details for Investigation

Some of the details of preliminary investigations and planning of requirements that would be disposed of by such an organization are as follows:

1. To make a general survey of all items of stock material to determine whether they are in good condition and salable and order disposition of such defective, obsolete or deteriorated materials as may be disclosed by such an investigation.
2. To see that all materials are located, are properly symbolized, classified and stored and are supported by proper records.
3. To instruct all factory operating departments to dispose of any strayed or defective material, and to see that all materials in the plant are supported by open production or betterment orders.
4. To advise the production control department to retard additional releases of work in progress immediately prior to inventory and to complete as many jobs as possible before the closing of the period.
5. To pass upon the basis for valuation and have a pricing system prepared, whereby all inventory items can be priced and extended for valuation immediately after the physical count and check; and to request all necessary assistance from various departments to prepare price schedules for different classes of the inventory.
6. To issue detailed instructions for taking the inventory defining the re-

From a paper prepared for the Industrial Cost association. The author is supervisor of cost and production control, Van Dorn Electric Tool Co., Cleveland.

sponsibility and part that each person is to assume, to thoroughly familiarize them as to methods and procedure and the proper persons from whom to seek advice as well as to whom to report irregularities.

7. To prepare proper classification and arrangement of inventory items in accordance with the purpose for which the same will be used.

If the advance planning and preparation is thorough, and if the organization has been properly instructed, a thousand and one questions have been answered; and the personnel can spend its efforts on the positive work of counting and listing instead of looking for a place where they may be of service.

Physical Account Taken Early

The next phase for consideration is the physical work of counting and checking the inventory. In organizations where the product is of large variety, and where the individual parts and classes of material may be in the thousands, it would be a physical impossibility to close the plant and expect an accurate count, check, listing and description of all items to be completed and vouched for as to accuracy the succeeding day, regardless of how large a force is detailed to the work. However, it is possible to accomplish this result by providing a method whereby the counting and checking can be started several weeks in advance of the closing period, and which automatically adjusts itself to the balance on hand as of the close of the period by accounting for the movements of stock during the interim.

Assuming that all stock on hand is supported by corresponding stores records, a balance verification can be made as of the date of counting and checking the stock. After counting and checking each item, the same is recorded immediately by the issuance of a set of serially numbered inventory tags in duplicate. The original describes the material, the location and the quantity inventoried, and is designed to standard dimensions for vertical filing.

The duplicate gives the same information as to description and initial count as the original, but in addition is provided with extra columns for recording any receipts or disbursements that may develop between the time of original count and the closing of the period. A small portion bearing the corresponding serial number is perforated so that it may be detached. This duplicate tag is secured to the material of which a record has been made, and the original sent to the stores department as a check against the records as of the date of issuance. The duplicate tag remains with the material until the close of the period, at which time an investigation committee is requested to check every bin or lot of material to see that the same is supported by a tag, and upon favorable report, a release order is issued, at which time the body of the tag is detached and the stub left attached for identification purposes in case a recheck is required. These tags are then checked against the stock records, and in case of variations, the receipts and disbursements are checked between the stock records as shown by the inventory tag all differences being reconciled by adjustment after a recount. It is at the time of a recount that the stub left attached to the material is valuable.

The remainder of the inventory work consisting of classifying, pricing, extending and listing is a matter of detail that requires no further explanation. In taking the work in progress inventory, it is assumed that all finished material has been cleared properly and sent to finished stock prior to the close of the period, and all open production orders have been reduced to the net amount of unfinished work in progress. All component production in progress is counted and checked, a tag being issued fully describing the point of completion to which the same has progressed at the time of listing.

After making an adjustment for the value of any completed production sent to stock prior to the closing of the period, these tags are sent to the cost department as a check against the corresponding production cost sheet. In taking inventories of assembling production orders in progress, the work can be facilitated greatly if bills of material are prepared in advance to support the inventory tags; and this record, when properly priced in detail, facilitates the work of arriving at an accurate value of such materials.

In considering the valuation of inventories, individual consideration must be given to the kind of industry and also to the cost finding methods. In accordance with requirements as stipulated in the regulations for making income tax returns, pricing of inventories may be based upon "cost", or "cost or market, whichever is lower," and special emphasis is placed upon the fact that whichever method is used, a change to another method cannot be made without special permission from the commissioner.

It is the opinion of the writer that inventories valued on the basis of "market" are both conservative and equitable, since it permits the results of each year to remain in absolute relationship to the results of other years, and does not unjustly penalize or reward a succeeding year for inventory carried forward from one period to another when it may have been purchased or manufactured under entirely different market conditions.

This can be illustrated readily by conditions during the war period, in which a considerable inventory may have been valued on the basis of a low cost, and liquidated during a rising market. The profits for such a period are not in relation to a reverse condition in which an inventory valued on the basis of a high cost is liquidated during a period of rapid reduction in selling price, even though the volume of business were the same in both instances. The error is apparent owing to the fact that the inventory at the beginning was not in relation to the replacement value, or its worth when compared with the purchasing power of cash during the period.

Although the pricing basis of "cost or market, whichever is lower," implies in its specification that adjustment is made, there seems to be no necessity for adjusting individual inventory items to less than their true market or replacement value for the purpose of being conservative; for if all inventory items are priced on the basis of "market," both conservatism and equity are considered fully.

Selecting Basis of Adjustment

The main object in adjusting inventories to market is the question of what to do with the resulting appreciation or depreciation, as it would be erroneous to take a profit or a loss without effecting a sale. This is answered with the fact that we split up our business years for the sake of convenience, treating each year as separate and unrelated. Actually this condition does not exist, since a business year may be normal or abnormal, and the results of past years are not buried, but are equally a hindrance or a benefit for future years; and since year merges into year, a method of compensation should be in force to adjust an abnormal year to a normal status. Therefore, if during an inventory valuation at "market" an appreciation results, this should not be interpreted as a profit, but should be set aside as a reserve against periods in which the conditions are reversed, and a depreciation would result.

To arrive properly at market valuations of inventories, it is necessary to value the prime elements of manufacturing cost, as contained in each inventory item. In all items of manufacture, the content of raw material, as measured by weight or dimension plus a percentage of waste, is normally the same. Therefore, if a market price exists on the bulk material, a value covering the content of such material in a given article can be computed readily.

In all items of manufacture the content of productive time for producing the article should be relatively constant, and since rates for various kinds of skilled and unskilled labor should be known, the content of direct labor can be determined easily for a given article.

If, therefore, a market price exists

on the prime factors of material and labor, a market price must exist on burden as applicable to each manufactured article if the basis for distribution is kept in relation to a normal volume of manufacture; and on a manufacturing volume of 50 per cent normal it is not attempted to distribute such fixed expenses as taxes, rent, insurance and depreciation, which are always in relation to a 100 per cent volume of manufacture.

Were this not true, we should admit beforehand that we have no tangible basis for establishing a selling price, and that we are dependent upon good fortune alone as to the possible result at the end of a period. In certain industries confined to the manufacture of a special product, in which sales are made on a contract or cost plus basis, inventories should be based upon proportionate completion, or on an accrual of actual cost at the date of inventory. To sum up, inventory is a current asset, and should be valued in relationship to the purchasing power of cash at that period, and should be accounted for accurately.

If clerical errors in cost details have resulted in accumulating excessive material or labor charges against one job, and a relative deficit of material or labor charges against another, it would not equalize the error by adjusting to "cost or market, whichever is the lower" inasmuch as the first item would be reduced to market, which is lower, and the second item would remain constant because cost is lower. This could be overcome by the measurement of the content of the elements of manufacturing cost contained in each article.

Business cycles of several years are comparatively normal, but business years are not always normal. To compensate for the abnormalcy of one period as affecting a subsequent period, a reserve for absorbing the inventory appreciation or depreciation of separate periods is a safeguard against the difficulties that confront us at the present time. If we set aside the abnormal profit against a period of falling market prices, which result in abnormal losses, a safeguard would have been established against over-expansion of industries; and the readjustment periods of the business cycle would be of shorter duration.

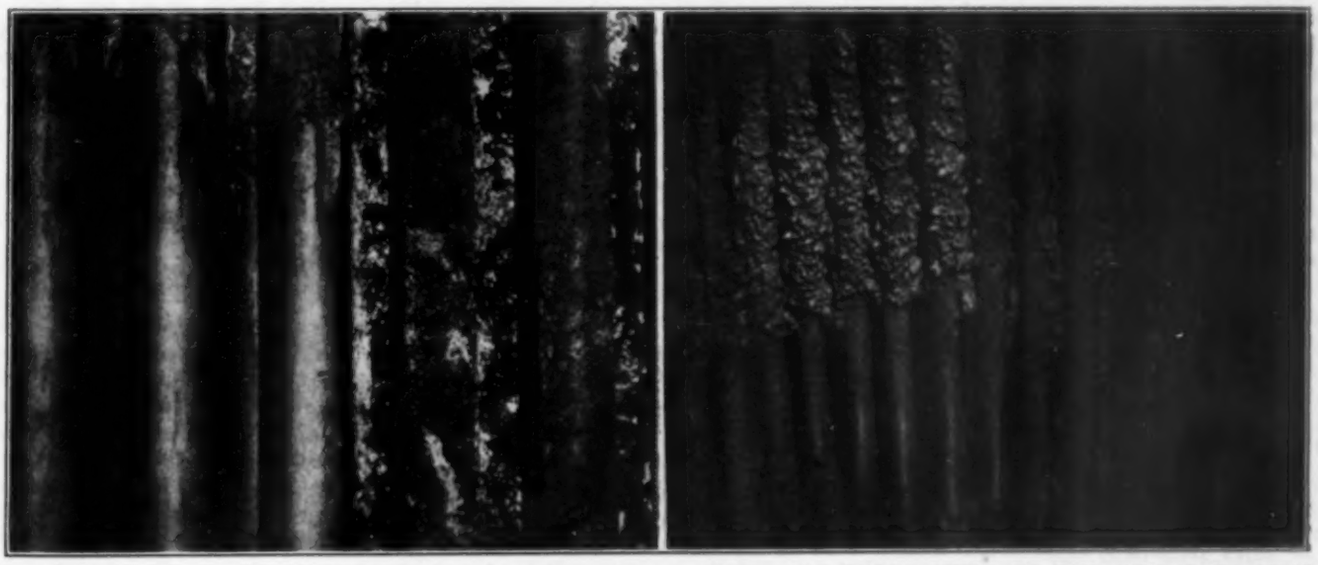
Studies Boiler Tube Slag Formation

BOILER and stoker development during recent years has tended toward extremely large units with the result that the increased grate areas and high gas velocities caused by high capacities have emphasized certain difficulties in operation. With the idea of eliminating these troubles as far as possible, the Westinghouse Electric & Mfg. Co., Philadelphia, made an extensive study of boiler operation, a number of experiments being conducted. Harry H. Bates, assistant engineer of the stoker department was in charge of the investigation which extended over six months. Certain deductions were made from the work and are outlined briefly in the following paragraphs.

One of the most serious problems was the formation of slag on boiler tubes. To overcome this trouble, it was first necessary to establish the cause of slag formation, how it is carried up to the tubes and the form in which it is deposited. It was necessary to go back to the formation of clinkers since the slag found on the boiler tubes and furnace walls is of the same material as the clinker discharged from the furnace, and the causes of one are to a large extent the causes of the other. The principal constituents of ash are silicon dioxide, aluminum oxide, ferrous oxide, ferric oxide and lime, but with the exception of ferrous oxide, none of the oxides will fuse alone at ordinary furnace temperatures. It is when these oxides are heated in intimate contact with each other that the real clinker forming difficulties arise.

The basic oxides act as fluxes on the silica with a lowering of the fusing temperatures of the combined material. The fusing temperature is dependent upon the oxides that are brought in contact with the silicon and the proportion of each, these basic oxides together with silica forming monosilicates. These monosilicates have a much lower fusing temperature than oxides of which they are composed. Tests made by the United States geological survey indicate that the tendency of ash to clinker is increased as the per cent of iron increases but this investigation showed that this was not invariably true. Iron combines with the silica in the form of ferrous or ferric oxides but not in the form of sulphides. However, it is only a matter of supplying heat and oxygen to convert the iron into its ferric state.

Sulphur found in coal frequently is blamed for the excessive formation of clinkers but sulphur is not a slag form-



EXAMPLES OF SLAG FORMATIONS ON BOILER TUBES. FIG. 1 (LEFT)—THE THREE TUBES ON THE LEFT HAVE BEEN SCRAPED CLEAN WHILE THE TWO AT THE RIGHT HAVE HAD THE SLAG KNOCKED OFF BUT NOT SCRAPED. FIG. 2 (RIGHT)—SLAG FORMATION ON SECOND ROW OF TUBES ILLUSTRATING HOW GAS PASSAGE BETWEEN FIRST AND SECOND ROW IS BLOCKED

ing material in itself. Usually it is found in the fuel as sulphates or pyrites which is ferric sulphide. The sulphates are not greatly troublesome but the larger portion is in the form of pyrites. It is the iron in the combination that is the disturbing factor. The bureau of mines has made an extensive research of the sulphur forms in coal and finds that pyritic sulphur comprises 40 to 60 per cent of the total sulphur except in two higher grade coals. If sulphur accompanies the mixture it retains its form as ferrosulphide and this material with the silicious matter makes an even more easily fusible mass than those already given.

This discussion of clinker formation also applies almost in its entirety to slag formations on boiler tubes and walls. The condition is suggested that the iron must be kept in its ferric state which is practically infusible and this can be done only by completely oxidizing the sulphur and iron before the tubes are reached. No free oxygen passes through a well broken up fire and unless excess air is added over the fire, incomplete combustion of carbonaceous matter and other oxidizable substances results. Thus complete oxidation of all slag forming constituents cannot be accomplished within the limits of the fuel bed proper.

The inherent characteristic of the underfeed type of stoker to burn fuel more rapidly over the tuyeres rows than over the retorts aids materially in supplying the required distribution of oxygen for the complete oxidation of all oxidizable matter but even with this type of stoker slag formations on the tubes and furnace walls are a serious problem with some coals. In fact all types of stokers have difficulty with slag formations.

This suggests that slag particles are carried up to the tubes with the draft in such minute form that they can be carried with a low velocity gas as well as with a gas that rises rapidly. An examination of the slag under a microscope reveals small spherical globules substantiating the belief that the particularly troublesome particles were the small ones. When these little particles come in contact with free oxygen in the furnace gas for sufficient time to completely oxidize them, they will become solid. If they solidify before touching the tubes or walls they are carried through the boiler as solid ash. On the other hand, it has been shown that no free oxygen is obtained through the fuel bed. Thus the particles remain in molten condition and are deposited on the tubes and walls where they may be either completely oxidized and solidified or covered by successive coatings or layers of the same class of material.

That the latter is true is shown by layers of dark vitreous material covered by a reddish brown layer of protective coating, this reddish coating being largely ferric material which prevents further oxidation of the dark ferrous material within by excluding the oxygen. Considerable of the material on the outer surface especially on the tubes is of a friable and nonfusible character, being of a completely oxidized nature. Many types of stokers and stoker auxiliary equipment have been built for supplying excessive air over the fire to complete burning combustible gases. Much progress has been made although considerable research in experimental work is yet to be done on the larger types of boilers. Even if some efficient means is developed for mixing the gas and excess air together it is questionable whether the slag difficulty will be overcome entirely.

Numerous samples of coal, ash and slag were analyzed, the analyses of slag being particularly interesting. Following are given typical analyses of the slag taken from both the boiler walls and boiler tubes.

	Furnace wall slag, per cent	Boiler tube slag, per cent
Ferrous iron	8.26	3.23
Ferrous iron calculated to ferric iron	9.18	3.58
Ferric iron, found as such.	6.71	8.71
Total iron	15.89	12.29
Ratio of ferrous iron to total iron	57.70	29.10

It is interesting to note that the slag on the furnace walls ran higher in ferrous iron than did the slag on the tubes. Consequently the slag on the walls was freer from the close friable and fusible material than was the material on the tubes. The hard vitreous appearance of the slag on the walls gave evidence of having been there in a molten and flowing condition until such time as the furnace was cooled below the fusing temperature of the mass.

Experiments were made to prevent slag accumulation, three general causes being pursued as follows:

1. By feeding some material in with the coal that would act as an oxidizing agent.
2. By feeding some vapor in with the air supply, which would dissociate and permit its oxygen to combine with the ferrous material present.
3. By intimately mixing air, at high temperature, with the rising particles, so as to completely oxidize them before reaching the tubes.

By analyses of the three courses the first was eliminated without trial. The second procedure was tried out by the injection of steam into the air supply but no decrease was noticed in the formation of the slag on the tubes. The third method of intimately mixing air with the gases is now being tried but it has involved the question of furnace construction and considerable time may be required before the best results can be obtained.

When it is considered that ash is finally divided in the coal and that some of it is certain to be carried up with the gas, the author states that the most fruitful field for development of means for slag prevention is in furnace and boiler design. This belief has been justified. At the same time there is still need for further development of apparatus for mechanically removing soot and slag from boiler tubes.

Explains Regeneration of By-Product Ovens

A transposition of words in the article "Modifies By-Product Oven Design," which appeared in the October 19 issue of IRON TRADE REVIEW, made one sentence meaningless. On page 1061 the first sentence of the first paragraph in the right-hand column should read as follows:

"When air flows upward in two regenerators, the gas supply flue located in the supporting wall separating these two regenerators is operated also for upflow combustion, while the adjoining heating wall operates for the discharge of waste gases and consequently the gas supply flue located in that particular regenerator wall is not in operation."

Students Work in Mills

The Jones & Laughlin Steel Co., Pittsburgh, has arranged to employ students working their way through Carnegie Institute of Technology, Pittsburgh, in the steel mills on Friday and Saturday nights or all day Saturday. The shifts are of ten hours length. The company is the first large organization in Pittsburgh to go to the aid of students in need of finances. The arrangement gives to the students in the college of engineering an opportunity to acquire practical as well as theoretical knowledge.

Farm Tool Exports High

Exports of agricultural machinery from the United States reached $3,352,657 in August, an increase of 46 per cent over July, making it the first month since July a year ago when the $3,000,000-mark was topped, states the department of commerce. Exports are exceeding all expectations, according to the department, and "should the figures continue to increase even moderately they will reach a total that seemed hardly possible at the beginning of the year."

Treating High Speed Tool Steel

Basic Lined Electric Furnace Usually Used for Making Tungsten Steel for Turning Tools, Cutters and Drills—Process of Manufacture Is Outlined—Standardization of Hardening Gives More Consistent Cutting Value

BY H. K. OGILVIE

ALTHOUGH the crucible still is employed largely as a melting medium in the manufacture of high speed steel, the method is of little technical interest, being entirely a melting operation with no refining possible. A small amount of sulphur generally is absorbed by the metal. Although this element is not quite so dangerous as in ordinary carbon steel, it is advisable, nevertheless, to keep it under about 0.06 per cent.

The labor and fuel costs are extremely high, but the plant and overhead charges are much lower than in the case of the electric process. The cost per ton of sound billets, however, certainly is in favor of the small electric furnace, even when the latter is only working nine or 10 hours per day. The steel properly made by the two methods seems to be equally good, and this is important, as the material cost is only a small proportion of the total cost of an average form tool.

Most of the crucible steel is cast into small ingots weighing up to a few hundred pounds each, and so long as the alloys have been completely melted there should be little segregation and few surface defects. When the ingot is forged into bars for turning tools, small cutters, and drills, the structure should be fairly homogeneous and uniform throughout. It sometimes happens, however, that small particles of tungsten compound are not completely melted, particularly when tungsten powder is used. These form extremely hard spots having a Brinell hardness generally over 600 when tested with a 1-millimeter ball and a load of 30 kilograms, and they persist throughout the subsequent operations and may completely destroy a fine-toothed cutter working on the otherwise soft material. It is thus desirable to introduce the tungsten by means of ferrotungsten or by the use of a tungsten-chromium alloy.

The basic lined electric furnace is used commonly for melting this class of steel, and the charge may consist entirely of high speed steel scrap together with a small amount of turnings. The latter should be heavy and clean and are placed under the electrodes and on top of the scrap until a bath is formed. Where a large amount of tungsten steel turnings have to be used up, it is preferable to add them gradually to the charge after it has been melted, but it is much more economical to use only good scrap, that is, heavy clean scrap with a high tungsten content, and to reject light and rusty turnings.

Turnings Alone Not Sufficient

To attempt to make good high speed steel from turnings alone, or where the greater part of the charge consists of turnings, is not commercially possible in England. One cannot determine with accuracy the percentage of elements present, and this may necessitate the addition of large amounts of expensive alloys. If the turnings are clean and oily the carbon in the metal when melted probably will be too high; if they are rusty it will be too low with considerable loss of chromium in the slag. The latter will be saturated with oxides and must be removed from the furnace, as time cannot be spent in reducing these into the steel. Even when using heavy clean turnings which can seldom be obtained in bulk, the loss will be at least 10 per cent. With average turnings bought from a scrap agent the loss may be 20 per cent or more. Added to this is the difficulty of melting the turnings without breaking the circuit or damaging the bottom, together with the increased repairs necessary to the banks of the furnace. On account of the high current and electrode costs every suggestion tending to shorten the length of each heat and consistent with making good steel should be encouraged, but in any case the time should not exceed 4½ hours from a 3 or 4-ton furnace.

When good scrap is charged the melting slag is comparatively clean and need not be removed, and the sample for analysis can be drawn as soon as the bath has been stirred up. During the next hour, while waiting for the content of carbon, tungsten, chromium, and vanadium, a heavy lime slag should be carried without getting the metal too hot. Probably a small amount of lump ferrosilicon may be required in the bath to deoxidize the steel completely, and the slag should be kept as white as possible, taking care that it is heavy enough to prevent the coal or ground electrode which is sprinkled on it from passing through into the metal. During this time most of the sulphur is removed from the steel.

The electrode coolers should fit closely enough to prevent the space between them and the electrodes acting as a chimney and drawing a stream of cold air through the furnace, having due regard at the same time to the slight variation in diameter of the electrodes themselves. With badly fitting electrode coolers, apart from the heat lost and the increased repairs necessary to the roof, the length of time required to reduce the oxides in the slag is prolonged while the consumption of electrode per heat is surprisingly increased. The doors should be heavy and fit well.

Double arches may be used with the best silica brick inside the furnace and ordinary firebrick on the outside, the latter withstanding the rapid charge of temperature much better. A bricklayer accustomed to this class of work can keep down the cost of repairs considerably, and will seldom interfere with the normal working of the furnace.

As in every other class of melting, attention must be paid to the furnace bottom and banks after each heat, particularly at the top of the banks where siliceous material from the roof and walls tends to gather. In the case of furnaces having a bottom electrode where the bottom is often considerably weakened by iron spikes or metal to increase its conductivity, it is important to remove completely any metal from pockets left after tapping the furnace. These should be carefully filled up with magnesite or dolomite mixed with a little basic slag and allowed to fuse partially.

Where a furnace of the Heroult type is in use probably the best method of making the bottom is that employed for the basic open-hearth furnace, using oil burners if no other means of reaching the necessary temperature are available. Layers of good

From a paper presented at the meeting of the Iron and Steel institute at York, Eng., Sept. 5-6.

FIG. 1 (LEFT)—OUTSIDE OF 18 PER CENT TUNGSTEN STEEL FORGING REDUCED FROM 12 TO 9 INCHES. X 60. COARSE TUNGSTIDE ONLY SLIGHTLY BROKEN UP. FIG. 2 (CENTER)—PHOTOMICROGRAPH OF CENTER OF CUTTER FORGING SHOWING ORIGINAL CASTING STRUCTURE TO BE PRACTICALLY UNAFFECTED. X 60. FIG. 3 (RIGHT) PHOTOMICROGRAPH OF A 9-INCH SLOTTING CUTTER MADE FROM AN 8-INCH INGOT. X 60

quality burnt dolomite mixed with a little basic slag are fritted on until half the thickness is reached. After saturating the bottom with slag and "setting back," the operation is continued, using layers of magnesite together with sufficient slag to render it just viscous at the maximum temperature obtainable until within a few inches of the necessary thickness. The top layers are completed with dolomite and slag and the furnace is finally held at a white heat for some hours by introducing coke between the electrodes.

By the time the metal has been melted the percentage of carbon, tungsten, and chromium should be slightly reduced but most of the vanadium will have been removed. The necessary amount of crushed ferrotungsten and ferrochromium is added as soon as the analysis is obtained, and the temperature of the steel is increased gradually. When the bath is in good condition enough ferromanganese is thrown in to give about 0.2 per cent manganese, and five minutes later the ferrovanadium may be added in a bag and well rabbled under the slag. The furnace should be tapped within the next 10 minutes if the samples are quiet and the temperature sufficiently high, and no additions to aluminum or any deoxidizing compounds should be made to the ladle or molds.

Occasionally at this stage when getting the metal hot enough to tap, the steel, in some of the smaller furnaces especially, suddenly becomes wild and if cast will rise over the tops of the molds even when considerable quantities of carbon, silicon, manganese, and vanadium are present. It is useless to attempt to deoxidize the steel with additions of ferrosilicon, etc. The only method which has given successful results in the hands of the author is to cool the steel without any addition until after thorough rabbling samples taken at regular intervals show the metal to be sound. It may be necessary in some cases to allow cooling to proceed until the steel commences to solidify round the banks. As this gas trouble has been quite widely known for a number of years, the author is rather surprised that so little mention of it has appeared in any of the home or foreign technical publications.

Wildness Is Unexplained

Why high carbon steel containing up to 1 per cent silicon and melted with every possible precaution should without any visible indication suddenly become so wild as to flow out of the test ingot requires some explanation, when the slag is apparently in good condition and practically free from oxide of iron. It is difficult to believe that the trouble is due to oxide of iron, which can scarcely exist in such large quantities in the presence of elements having a greater affinity than iron has for oxygen. Also a sample ingot, badly honeycombed after forging and rolling, showed apparently thorough welding of the gas holes, and gave impact and bend tests equal to sound steel of similar composition. At the same time there is undoubtedly a reaction between the gases and the silicon and manganese present when the steel is sufficiently cooled with consequent slight reduction of these elements, but during the time the metal is hot and wild there is no greater oxidation of silicon, manganese, or vanadium than normally takes place with sound steel under approximately the same conditions. Also the milder the steel to be made the more liable is the trouble to occur, taking into account the slightly higher casting temperature of the low carbon steel. This may or may not be due to the fact that no carburizing material is added when the melting slag is removed. While the temperature seems to be extremely important the method and rate of generating heat appears to be more so.

No such trouble is met with in a furnace such as the Rennerfelt, where heating is done almost entirely by radiation, or in basic siemens practice, where equal temperatures are attained so far as can be judged by the fluidity of the steel. The metal in the electric furnace is always hotter when the first slag requires removal than it is when ready to tap the furnace, and when a clean slag is put on and fused a small amount of ferrosilicon is sufficient to render the steel quite free from any tendency to rise in the mold. Yet as the refining proceeds and the slag becomes practically free from effective oxides, the danger of gas trouble appears to increase. In this way it is similar to overpoled electrolytic copper which, while theoretically free from oxygen, swells and evolves gases on solidifying. Although this gas trouble does not often happen with high speed steel, attention is drawn to the fact that it is by no means unknown in arc furnaces.

It is important to remember that this class of steel oxidizes in the sample spoon more quickly than carbon steel, and allowance should be made for this when judging the temperature of the metal. No instrument gives consistent results in practice when attempting to measure the temperature of molten steel, but it is seldom that the usual pouring and film tests when carried out under the same conditions each time fail to give

extremely good results. Where there is some doubt it is better to get the steel into the ladle too hot than too cold, especially if there is any device attached to the latter to regulate the speed of casting.

Octagon Molds Preferred

The ingots for each melt should not vary greatly in size and octagon molds are to be preferred. Casting should be done from the top of the mold, having the metal in the ladle hot enough to permit the slag to rise to the surface, and as small a nozzle should be used as will pour the whole heat at such a rate that lapping of the ingots is just avoided, no crust being permitted to form on the surface of the steel as it rises in the mold. This allows the ingot to solidify in the most natural manner, preventing the formation of large tungstide network and keeping the pipe down to a minimum.

Bottom pouring may improve the surface of the ingot slightly, but as the whole ingot is in the liquid state when the mold is filled with the hottest metal at the bottom, partial segregation of tungstide results to a serious extent when the tungsten is about 16 per cent or more and the ingot is over 5 inches or 6 inches diameter, unless the steel is dangerously cold. The waste of metal in the trumpet and runners, and the expense and time involved in using these, does not seem to be justified. This steel also is much more searching on fireclay material than any other class of steel, and it is not common to have a runner burst when the casting operation is almost completed, leaving only a shell of metal in the molds. It is perhaps unnecessary to add that the molds should taper slightly towards the bottom, and the head box must be a good fit. Should metal be allowed to penetrate here it is quite likely that the shoulders of the ingot will not be able to withstand the tension set up during cooling, with the result that the transverse surface cracks at this point will cause a considerable loss of material.

It is as well to keep the ingots under about 8 inches in diameter and 1000 pounds in weight. When it is necessary to cast both large and small ingots from the same ladle, the Batty type nozzle attachment is convenient and is also useful when the temperature of the steel has been misjudged. In any case when the ladle contains more than a ton or so of metal, one is justified in having two stopper rods, although the nozzles need not be of the same capacity. The sand used for testing the working of the rods, however, must be blown out of the ladle completely.

The ingots should not be allowed to become quite cold but should be transferred to the reheating furnace while they are still at a temperature of 200 or 300 degrees Cent. So long as the ladle and molds have been kept clean no serious surface defects should be visible, and a quick examination is all that is necessary before heating for forging. The billets, however, after cooling slowly must be carefully examined, and any surface cracks and other flaws removed by grinding a little deeper than is thought necessary. The care expended in this operation ought to yield a high proportion of sound rolled bars free from seams and also free from straight surface cracks which are only visible after the tool has been hardened.

It is not good practice to make fairly large thin cutters direct from forged bars unless the bore of the cutter is extremely wide. It is preferable to use a medium-sized ingot and to forge it in the usual manner to 4 inches or 5 inches round. A blank cut from this is then thoroughly forged until the required diameter is obtained. The photomicrograph in Fig. 1, taken at only 60 magnifications, shows the outside of an 18 per cent tungsten steel forging which has been reduced under the press from 12 to 9 inches diameter. The coarse tungstide residue is only slightly broken up. Fig. 2 at the same magnification is from the center of the forging and shows the original casting structure to be practically unaffected. At this power the steel correctly forged should be almost structureless. Fig. 3 shows an example of a 9-inch slotting cutter made from an 8-inch ingot treated as above described.

Structure Coarse in Center

Many large cutters made entirely of high speed steel are not by any means ideally forged, yet the outside of the cutter where the teeth are machined has often a fairly good structural appearance. Towards the center, however, it becomes gradually coarser, and on hardening, fracture is liable to take place from the keyway in spite of the largest possible radius. Should there be no keyway, the cutter often fractures when put to work. As this coarse structure is so easily detected under the microscope, and often with the naked eye on the polished and etched steel, the steelmaker has no option but to replace any fractured material where it is present, even if the direct cause of failure be due to faulty hardening. At the same time there are few things so annoying as to have an intricate lot of cutters fail in the hardening operation, after

FIG. 4 (LEFT)—STRUCTURE AT CENTER OF ¼-INCH SQUARE BAR HELD AT 1300 DEGREES FOR FIVE SECONDS. X 1000. FIG. 5 (CENTER)—A SIMILAR BAR HELD AT 1300 DEGREES CENT. FOR 35 SECONDS. X 1000. FIG. 6 (RIGHT)—PHOTOMICROGRAPH OF A BAR RAISED TO JUST 1300 DEGREES AND NOT COMPLETELY AUSTENITIC AT THE CENTER. X 1000

considerable time spent on machining, and it is little satisfaction to know that some day the material will be replaced.

The general hardening practice is to quench the part in oil from a temperature of 1250 to 1300 degrees Cent. and to temper it either in an oil bath at 220 degrees Cent. or in a salt bath at 60 degrees Cent. In certain cases the tool may be hardened in an air blast or may be allowed to cool normally in the air, depending chiefly on the size and design and whether the slight additional scaling may be disregarded.

Results of Heat Treatment

The majority of high speed steel tools seldom approach their breaking down point when cutting in ordinary works practice, and for these a 14 per cent tungsten steel with about 0.65 per cent carbon and 4.5 per cent chromium, with or without a small percentage of vanadium, gives quite satisfactory results if hardened in oil from 1250 to 1260 degrees Cent. and tempered at 220 degrees Cent. Where a heavy duty cutter has to work at its maximum efficiency, better results are obtained from an 18 per cent tungsten steel having 0.6 per cent carbon and about 4 per cent chromium with 1 per cent of vanadium. This is hardened in air or oil from 1300 to 1310 degrees Cent. and tempered at 590 to 610 degrees Cent. when it has the greatest amount of secondary hardness or capacity to resist softening, until the tips of the teeth reach a temperature of 625 degrees Cent. or a little higher, the exact temperature depending on a number of factors. Laboratory tests show that by tempering at 600 degrees Cent. the apparent hardness is not materially affected so long as the necessary hardening heat has been attained, while the cutting hardness is increased, the toughness or the resistance to shock, such as when the tool strikes the work, is substantially increased. Test bars treated in this way show a toughness increase of 100 to 150 per cent over the same steel tempered at 220 degrees Cent.

Less harm is done to a fine threaded tool by rushing it up quickly from 800 to 1300 degrees Cent. when hardening than by soaking it for a minute or two at 1250 degrees Cent. In view of the fact that some articles may show softness after tempering at 600 degrees Cent. depending to some extent on the percentage of carbon and chromium in the steel, it is important to make quite certain of the exact hardening temperature. Under different lighting conditions and with different types of hardening furnaces, optical and radiation pyrometers may read inaccurately thus a carefully calibrated platinum-rhodium thermocouple suitably protected should be used in the first case, and the radiation pyrometer checked against this. Time spent on standardizing the details of hardening is well repaid by obtaining more consistent cutting values.

The length of time that the steel remains at the hardening temperature is most important. The photomicrograph in Fig. 4 at 1000 diameters shows the structure at the center of a ¼-inch square bar, which had been held at 1300 degrees Cent. for five seconds as near as one could judge, while Fig. 5 also at 1000 diameters is from a similar bar kept 35 seconds at 1300 degrees Cent. The difference in grain size can be seen easily, and while the first bar retained a load of 130 pounds with a deflection of 0.045 inch on 5 inches before breaking at the notch, the second bar withstood only 92 pounds, the deflection being 0.033 inch. A bar raised to just 1300 degrees Cent. although not completely austenitic at the center, withstood 142 pounds and showed a deflection of 0.052 inch. Fig. 6 is a photomicrograph of this bar also at 1000 diameters. The usual tests for hardness gave no apparent difference in these bars.

Recommends Higher Temperature

On production work where a more or less constant amount of metal is passing through the hardening furnace, it is well to have the high temperature chamber about 10 or 20 degrees Cent. above the correct hardening temperature, so long as the time in this chamber is a constant for the same class of tool.

It has been found by cutting tests extending over two years that screwing dies and many other fine threaded tools give better results when a high tungsten steel and a high hardening temperature are used, although the secondary hardness is not taken advantage of, as the teeth do not exceed at the most a temperature of 250 degrees Cent. under normal screwing conditions. Yet the resistance to abrasion is high. One would presume that this is at least theoretically wrong, for with high tungsten a considerable number of brittle tungstide globules remain out of solution after hardening, and on the tips of the finest teeth would be liable to break away from the matrix, as sometimes happens during the polishing of the steel for microscopic examination, and thus lead to wear and possibly fracture.

The hardening of certain screwing dies, which may have as many as 68 V-threads per inch, is a most difficult operation when using the ordinary two-chamber furnace. Little scaling is sufficient to clog up the teeth, and this scale cannot be removed by sand blasting, or the crests of the threads are blown away. At the present time, when many firms are well equipped with projection apparatus for measuring the form of screw threads by magnifying them 50 times or more, some better method of hardening is essential.

The difficulty has been overcome in the case of the contributor's firm by designing a gas fired carborundum tube furnace for hardening these dies. An automatic feed is used where the temperature of the maximum heat zone is recorded accurately and where the tool is in a slightly reducing atmosphere from the time it is introduced into the furnace until it enters the quenching bath. By this means there is no scaling whatever, and distortion troubles and also slight variations due to the personal element, which are so difficult to eliminate entirely, are kept down to a minimum or altogether avoided.

It is unfortunate that no rapid test exists for determining the actual cutting hardness of hardened high speed steel. The file and the Brinell test are commonly used but are by no means satisfactory. Both are useful when always using a steel of nearly the same composition hardened under standard conditions, but neither gives definite information as to the cutting properties of the tool. Both serve, however, to separate material within fairly wide limits. Cases are numerous when one method of testing gives quite a different impression than some other method. For example, a low tungsten steel of 0.65 per cent carbon, 6 per cent tungsten, 6 per cent chromium, hardened in oil from 1000 degrees Cent. is quite easily filed, although on a section ½ x 1 inch the Brinell hardness is 650. When hardened from 1300 degrees Cent. it is impossible to file it, although the Brinell number is not over 550. In both cases tools treated in this way cut high carbon annealed steel of 220 to 230 Brinell almost equally well. Similarly, an 18 per cent tungsten steel oil hardened to give 550 Brinell will not resist wear so well as the same steel hardened and then tempered about 630 degrees Cent. to give 550 Brinell.

Results of Tests Uncertain

Scratch and rebound tests seem to give anything but consistent results, and it would appear that magnetic

and electrical tests have not yet been successful in solving this problem. A collection of all the known data from these tests would be valuable and might allow more work to be done in this direction. The author is indebted to Alfred Herbert, Ltd., Coventry, and also to Walter Spencer & Co., Sheffield, for permission to publish a number of the details in this paper.

Reports on Accidents in Steel Industry

Accidents in the iron and steel industry decreased materially in 1919 over the previous year according to a report recently issued by the United States bureau of labor statistics on "Causes and Prevention of Accidents in the Iron and Steel Industry, 1910-1919." According to this report the number of accidents decreased in 1914-1915 over 1913 due to the decline in the number of men employed. Employment was increasing from May, 1915, to December, 1917, the accident rate for the same period showing an increase. A decline started at this time and was in progress at the close of 1919.

Each of the chief causes of accidents, such as machinery, falls, etc., are presented in such a way as to show clearly the relative conditions in the various departments. Considering machinery as a cause of accident, it was found that the electrical department stands at the head of the departments in which there were injuries. The open hearths were second and the fabricating department third under this classification. It was also found that under the classification of hot substances and falls of workers, the electrical department stood first in the number of accidents.

The report also contains a discussion on methods to be used by the safety man in the prevention of accidents.

Prevents Gas Explosions

The accumulation of explosive gas in sewers, closed vaults containing control apparatus, electrical or otherwise, and in transformers and similar apparatus, has led to disastrous results when accidentaly ignited. The gases accumulating under these conditions may arise from a variety of causes, but in general they are hydrocarbons with occasional mixtures of hydrogen and carbon monoxide. A lamp, recently developed under the direction of Dr. H. C. P. Weber, of the Westinghouse Electric & Mfg. Co., Pittsburgh, eliminates the danger of explosion by continuously removing the explosive mixture by burning it more rapidly than it can accumulate. This is accomplished by oxidizing the gas at a temperature considerably below that at which the explosive wave is propagated. It is possible to do this by the use of an oxidative catalyst finely distributed over a porous surface.

The lamp base is of the ordinary type and may be screwed into a lamp socket carrying 110 volts. The filament itself may be used in the form of a coil, cylinder, or of tubes arranged in the form of a hollow cylinder, and is surrounded by a fine mesh wire screen which, working on the Davy principle, prevents the possibility of an explosion by any flame that might be formed in the interior. The feature of the device is the application of a catalyst to a considerable porous surface, and the control of the resistance of the whole system so that it will take a safe operating temperature. By means of a series of tests, it has been found that the most satisfactory temperature, using a platinum catalyst, is between 600 and 800 degrees Cent. However, the temperature depends on the composition of the catalyst used.

Offers Suggestions for Thermit Welding

To assist in the repair of heavy sections by the thermit weld method, the Metal & Thermit Corp., New York, recently has prepared a number of suggestions and recommendations. Previous directions for making plastic the yellow pattern wax to be applied between the sections to be joined recommended that the wax should be placed in a pan and heated until it became plastic, or else melted entirely and then allowed to cool until in the plastic state. Another satisfactory way of making the wax plastic is to pour the melted wax in a small stream of cold water. It can be removed in a short time and, after the water is squeezed out by hand, will be found sufficiently plastic for use.

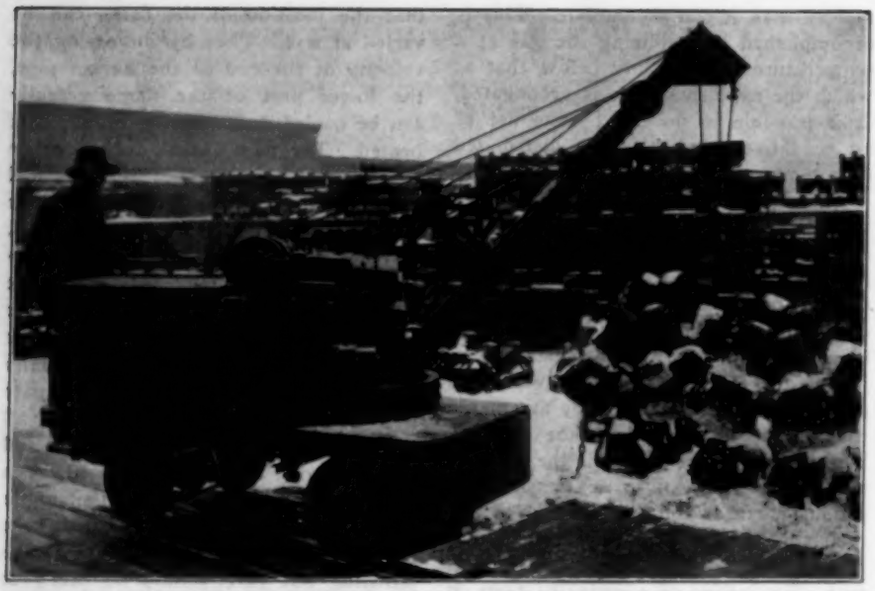
After hollowing out the basin in the top of a rammed up mold, a channel or trough should be cut in the top surface of the mold, connecting the top of the pouring gate and the riser. This will cause the first slag, overflowing on the top of the mold, to run across to the riser quickly and thus will equalize the pressure on the pouring gate and the riser while the metal is in a liquid state.

Use of gas for preheating in thermit welding should be discouraged. To preheat the section without badly burning away the preheating gate, it is necessary to use vaporized fuel, gasoline or kerosene, which can be blown into the mold at such a velocity that the location of the flame can be varied at will. Thus by increasing the velocity at the end of the burner pipe, the lower part of the flame actually can be cooled down and the upper part heated. The flame at all times can be so regulated that the heating gate will be dried out but not burned, which is not the case with any gaseous fuel, whether it be natural gas or illuminating gas. In all such cases the flame will start at the end of the burner or will be thrown completely out. This mass of flame passing continually through the restricted heating gate will do considerable harm and in all cases the lower part of the mold and section being preheated will be at a higher temperature than the upper end. Too rich a flame during the early part of the preheating may be harmful, but care should be taken at the end to see that no excess oil is used so that the lean flame will tend to burn out any oil from the molding material that may have penetrated during the early part of the preheating.

Mining of Clay in 1921 Shows Decrease

Statistics showing the clay produced in the United States and sold as clay are shown in a report recently published by the United States geological survey. The general business depression had a marked effect on the clay mining industry in 1921, the output decreasing 45 per cent and the value 48 per cent as compared with 1920. Fire clay, which showed the largest output in both quantity and value decreased 49 per cent in quantity and 52 per cent in value, as compared with 1920. The output of every kind of clay decreased in quantity, value, and average price per ton. Imports and exports of clay decreased in even greater proportion than the domestic production. Less fire clay was mined in 1921 than at any time during the last 10 years. The production in 1921 amounted to 1,195,861 short tons valued at $3,560,373 compared with 2,341,076 short tons valued at $7,425,674 in 1920. 2,347,972 short tons valued at $5,625,095 in 1917, and 1,695,337 short tons valued at $2,363,357 in 1912.

Reports showing the output of clay by uses are incomplete since many of the clay producers do not know the purposes to which their product is put, but according to figures obtainable, 390,911 short tons of fire clay was used for fire brick, 211,790 short tons for fire clay mortar, including clay processed for laying fire brick, 588 short tons for clay crucibles, and 155,080 short tons for foundry use and for cupola lining.



ELECTRIC STORAGE BATTERY CRANE BUILT FOR RAILWAY AND INDUSTRIAL PLANT WORK

Builds Crane for Use in Railway Shops

A crane built particularly for railway use, but which has many applications in steel plants, industrial plants, warehouses, etc., has been introduced by the Baker R & L Co., Cleveland. The crane may also be used to supplement the traveling crane in large shops where the amount of work required exceeds that which can be accomplished by the traveling crane. The accompanying illustration shows the use of the crane in a locomotive works. In the steel plants and foundries the crane handles pig iron or scrap by means of an electromagnet which takes its power either from a second set of batteries or from an independent power line.

The crane is equipped with three motors to take care of the boom hoist, the load hoist and swiveling. The motors are controlled by push buttons on the dash directly in front of the operator who must keep his finger on the button as long as he wishes the motor to operate. As soon as he removes the finger, the power is shut off and the solenoid brake brings the motor quickly to rest. Limit switches also are provided, to prevent overrunning. The machine is built for a maximum capacity of 3000 pounds at 7-foot radius.

Apparatus designed by the United States bureau of standards will regulate the corrosion tests, now being conducted on various metals, more closely than is possible by simple immersion in acids, the usual method employed in a test of this kind. The apparatus is designed to raise and lower the specimens so that they will be subjected to alternate attacks of the acid and other corroding liquids and the oxidizing action of the atmosphere.

Operates Warning Signal when Feed Stops

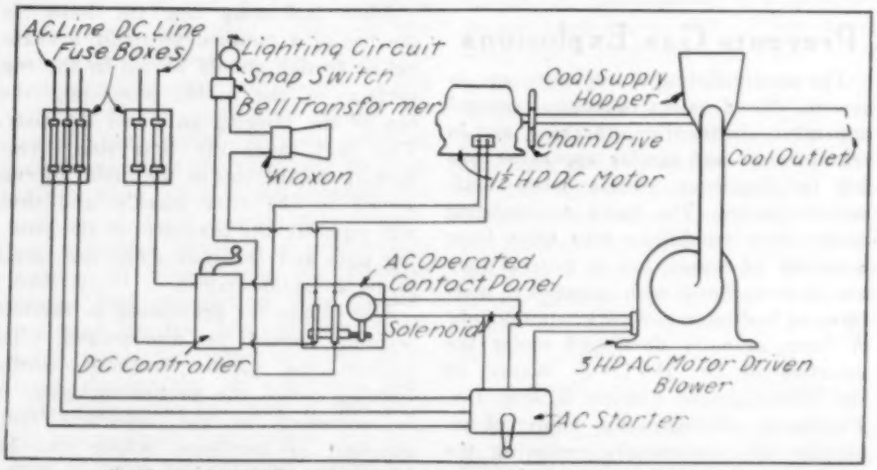
By E. J. Edwards

Considerable trouble with a powdered fuel burner has been caused when the alternating current has been cut off. To obtain a variable speed on the coal feed motor, direct current is employed; but the blower, built for constant speed, runs on alternating current. The volume of air in the pipes is regulated by suitable dampers in the pipe line. When the alternating current was off the blower would stop, but the coal screw would continue feeding and as a result the burner would choke. This would necessitate taking the burner apart, cleaning it and frequently replacing broken parts. The same condition might obtain if the operator carelessly started the coal screw first instead of the blower when starting the burner. The accompanying diagram illustrates a device recently installed which automatically stops the coal feed screw when the blower stops and at the same time sounds a horn to attract the operator's attention.

The blower unit is started first by the alternating current starter, as the direct current motor cannot be started until after the alternating current motor. When starting the alternating current motor, a solenoid is energized on the alternating current contact panel equipped with two contact fingers. One finger is in the coal feed motor circuit and the other finger is in the signal horn circuit. Energizing the solenoid causes the coal feed circuit to close and the horn circuit to open. When the blower is shut down, the solenoid becomes dead automatically shutting down the coal feed circuit and at the same time closing the signal circuit which immediately attracts the operator's attention. The horn may be shut off by a snap switch until the burner is again started. The warning signal is on a lighting circuit in which a transformer reduces the voltage to approximately 12 volts. The horn is attached in series to the finger on the contact panel. The coal feed is chain connected and is driven by a direct current motor. In the circuit a finger is mounted on the contact panel, automatically operated by blower circuit.

Tests Ground Coat Enamel

Preliminary tests have been conducted by the United States bureau of standards to determine the causes of specking of ground coat enamels. This specking appears in spots of oxide and slag in the enamel coating, a condition which appears to be due to excessive local rusting of the steel previous to the firing of the enamel. The results



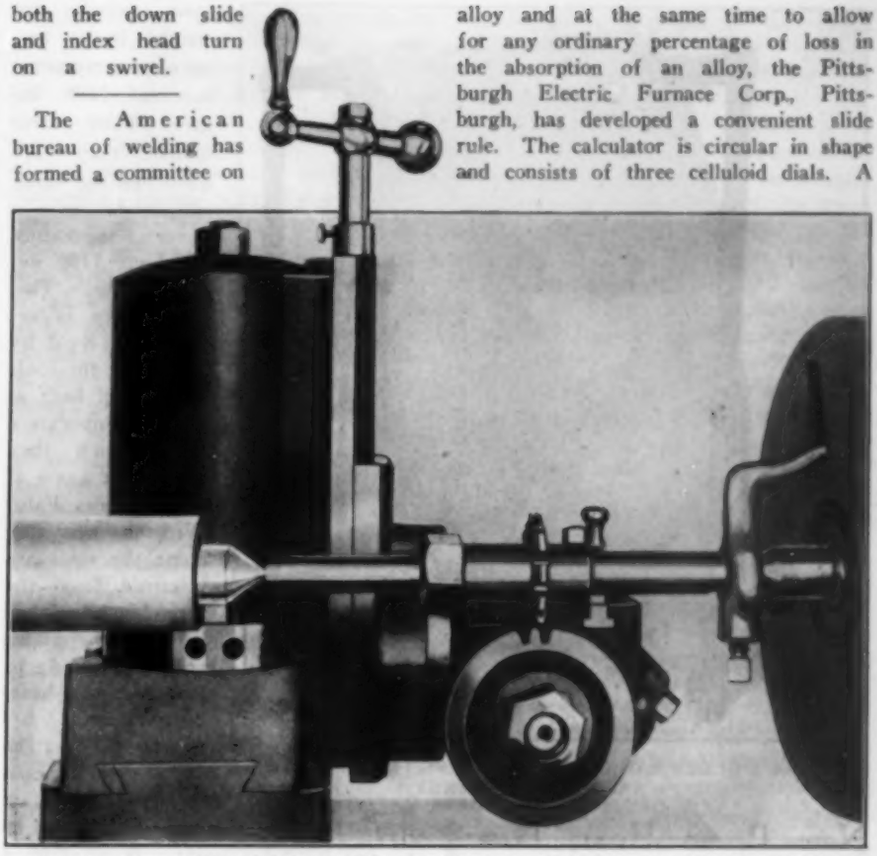
GENERAL LAYOUT SHOWING LOCATION OF WARNING SIGNAL

of the tests indicate that the rusting and subsequent specking are due to an excess of acid or salts in the enamel. The defect has been remedied by the addition of sufficient sodium hydroxide to the enamel previous to the dipping operation. The investigation is to be continued.

Devises Attachment for Light Milling

To make possible light milling operations on lathes, planes, shapers and drill presses, the Production Machine Tool Co., Cincinnati, has introduced an attachment which will produce a wide range of work. The device, which is shown in the accompanying illustration, is built in three sizes for lathes of 12 to 24 inches swing. Cutting spur and bevel gears, surface milling, angle cutting, splining and keyways can be done with the attachment which is provided with a dividing head. On the drill press the device accurately spaces holes to be drilled while on planers and shapers, it is used as a dividing head.

The index head is set up quickly as only two gears are used at one time. The index plate is complete showing the gears to be used and the required number of turns of the index handle to obtain divisions from 2 to 360 degrees. It is claimed that the attachment can be used to advantage on a wide range of work. It fits the tool post slot in the top slide of the compound rest of the lathe and is clamped into position as in the tool post. The lathe supplies the power and carries the cutter on an arbor between centers. Both longitudinal and cross feed is furnished. In addition to the movement of the top slide and compound rest on the lathe, the down slide of the milling attachment is operated by a convenient handle. Any angle is obtainable as both the down slide and index head turn on a swivel.



THIS ATTACHMENT MAKES LIGHT MILLING POSSIBLE ON LATHES, PLANERS, SHAPERS AND DRILL PRESSES

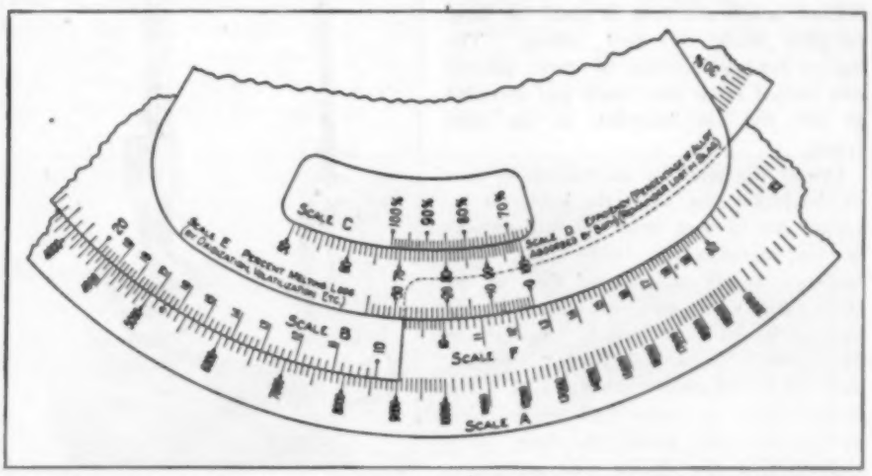
The American bureau of welding has formed a committee on welded pressure vessels of which a member of the United States bureau of standards staff is chairman. Tests are to be made on tanks to obtain information for the preparation of safety codes and especially for the use of the boiler code committee of the American Society of Mechanical Engineers.

Slide Rule Calculates Alloy Additions in Melting

For calculating quickly the additions of various alloys and various metal mixtures to allow any given percentage of alloy and at the same time to allow for any ordinary percentage of loss in the absorption of an alloy, the Pittsburgh Electric Furnace Corp., Pittsburgh, has developed a convenient slide rule. The calculator is circular in shape and consists of three celluloid dials. A portion of the rule is shown in the accompanying illustration. Directions for operation are given on the reverse side of the dials.

The device is intended principally for the aid of the furnace superintendent and melter in the foundry. However, on account if its rapidity and accuracy in making calculations, it suggests an extensive use in the metallurgical field in general.

With reference to the accompanying illustration, the operation of rule may be given briefly as follows: Over the weight of the charge on scale *A* set the number of points of alloy to be added on scale *B* holding these points together; over the grade or percentage of alloy in the ferroalloy on scale *C*, set the efficiency of the alloy on scale *D*. Under the per cent of melting loss on scale *E*, read the number of pounds of ferroalloy required.



PORTION OF A CIRCULAR SLIDE RULE FOR CALCULATING ALLOY ADDITIONS IN FURNACE WORK

Analyzes American Coal

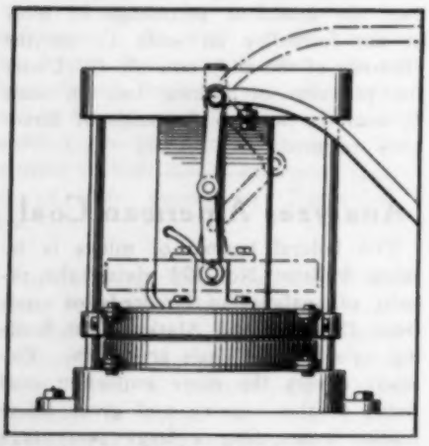
The federal bureau of mines is issuing bulletin No. 193 giving the results of analyses of hundreds of coals from 25 states and Alaska. The heating values of all coals are given. The study covers the more important coal fields of the country and gives information concerning a large percentage of mine outputs. The bulletin may be obtained by writing to the bureau.

THIS BAG HOLDER FACILITATES PLACING SMALL CASTINGS IN BAGS FOR SHIPMENT

New Press Heat Treats Saws Electrically

To simplify the heat treating of saws and flat tools, A. J. Harry, 1315 East 143rd street, Cleveland, recently has patented a new press which in addition to providing the necessary heat treatment exerts sufficient pressure on the work to prevent its warping after removal from the press. A side view of this press is shown in the accompanying illustration. The device consists of a base plate and a movable top plate which is raised and lowered by means of a handle and crank arm. Both plates are heated electrically by means of coils placed inside, the temperature being indicated by a thermocouple.

High speed steel articles such as disk saws usually are treated in a furnace to a temperature of 2250 degrees Fahr. after which they are quenched by being subjected to a lower temperature of about 1150 degrees Fahr. This second step is accomplished by quenching the tools into an oil bath at room temperature after which they are drawn again at 1150 degrees Fahr. With the new machine the saws are removed from the furnace and placed between the plates and subjected to pressure, the heating elements being operated at the same time to cool the work down from 2250 to 1150 degrees Fahr., or the red hardness point. It is claimed that the saws are maintained straight and the mechanical and structural conditions are such that no further heat treatment is required.



SKETCH OF ELECTRICAL HEAT TREATING PRESS FOR SAWS AND FLAT TOOLS

Designs Bag Holder for Packing Castings

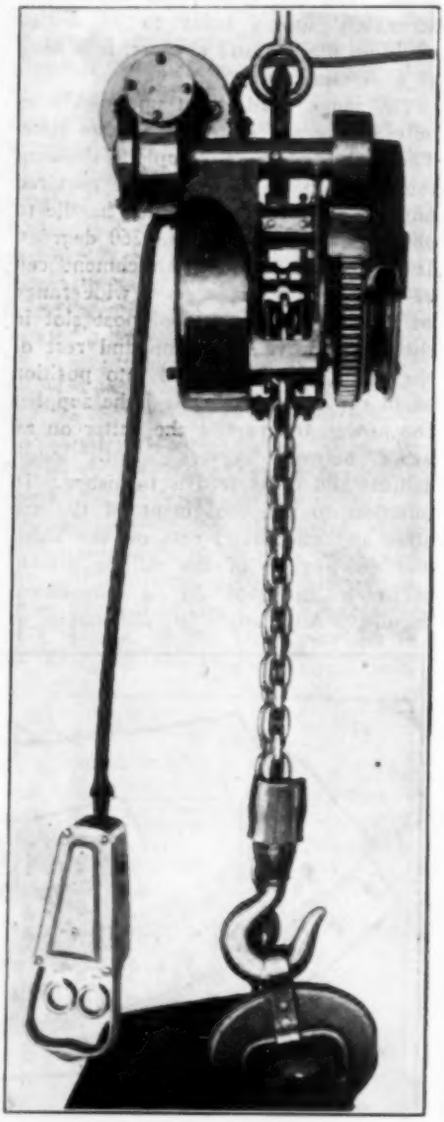
Of special interest to producers of small castings and manufacturers shipping products in burlap bags is a convenient bag holder designed by the Malleable Iron Fittings Co., Branford, Conn. A view of the device with the bag in position is shown in the accompanying illustration. The holder is made of two semicircular steel frames at the top and bottom, which are held in place by three uprights made of steel tubing. The bag is held in position by three pointed pins turned from steel stock and threaded at one end for insertion in the steel frame.

One of the pins for the holding of bags of the larger size when the holder is inverted can be seen near the left upright in the accompanying illustration. The holder is larger at one end than at the other, and when used as shown in the illustration will accomodate bags up to 16 inches. With the holder inverted, bags up to 30 inches can be used. The holder rests on three ball shaped feet and is slid easily around the floor. It is claimed that the device will produce a saving in the cost of packing bags preparatory to shipment.

Builds New Motor Driven Chain Hoist

A motor driven chain hoist designed to perform operations lying between the field of the standard chain hoist and that of the traveling crane, has just been introduced by the Motorbloc Corp., Summerdale, Philadelphia. The accompanying illustration shows a front view of the hoist. The machine consists of a standard chain hoist of steel construction operated by the application of a specially designed heavy duty motor with well proportioned gearing and slip friction clutch applied by means of a malleable iron supporting bracket.

Care has been given to features of compactness, symmetry and balance. The armature shaft and worm are carried on heavy duty ball bearings with provisions made for automatic lubrication. The self-contained pendant controller is operated by the fingers of one hand, leaving the other hand free to guide the load. This arrangement makes it possible for one



COMPACT CHAIN HOIST WHICH IS MOTOR DRIVEN

man to accomplish what would require two or more men for lifting and placing the same load. The new device is built light, the 1-ton size weighing 148 pounds. For occasional use at points where electric current is not available, or in event of the temporary failure of electric power, the hand chain can be applied quickly and the hoist operated as an ordinary block.

While furnished as a complete hoisting device, the self-contained motor unit can be readily applied to the standard chain hoists already in service. Due to its real portability and the fact that it can be put into service with simple mechanical and electrical preparation, the crane is adaptable in factories and warehouses.

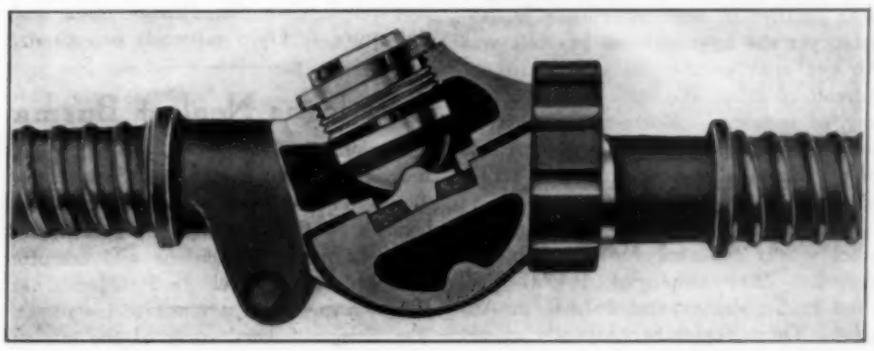
Reciprocal Registration Adopted for Engineers

Rules providing that an engineer registered in one state may be permitted to practice in other states which are parties in reciprocal registration of professional engineers, were agreed upon a conference of the council of state boards of engineering examiners held recently at Chicago. The articles of agreement prepared by the conference will be sent to the various state boards of engineering examiners and will placed in operation as rapidly as signed by the various board. A resolution was passed by the conference suggesting that each state board endeavor to have the laws changed where necessary in order to allow an engineer going from one state to another to register without the payment of another fee. A committee was appointed to investigate the possibility of a reciprocal registration with Canada and Mexico.

Designs Automatic Valve for Hose Coupling

An automatic air house coupling to be used on compressed air lines, has been recently introduced by the Robinson Machine Co., Muskegon, Mich. The accompanying illustration shows a cross sectional view of the coupling in a position ready for use. The appliance is a combined valve and coupling made in two halves. The half containing the automatic check valve is so constructed that the pressure of the air in the line comes on the top of the valve insuring a constant valve action. The valve proper consists of a brass stem with a renewable leather disk valve facing, which is easily replaced without special tools. Two projections with a crossbar extending beyond the valve seat act as a protection for the valve when it is dragged along the floor. This crossbar forms a pivot for hooking on the hose end shank when making the connection.

The hose shank half has two small projections beyond the valve face to push open the valve when the connection is being made and thus admit the pressure to that section of the line. An eccentric clamping ring quickly locks the two halves of the coupling together. This device is claimed to save the time of the operator and also the volume of air in the line between the compressor and the point of cut off.



AN AIR HOSE COUPLING WHICH HAS AN AUTOMATIC CHECK VALVE

Zinc Contracts Overload British Government

Washington, Oct. 24.—Contracts between the British government and the Commonwealth Proprietary Association of Australia to develop the inter-empire zinc resources and industry, assure an ore and metal supply for British industry but are proving costly at this time, states H. B. Allin Smith, assistant trade commissioner at London, in a report to the department of commerce. He says in part:

"The contracts cover the supply, first, of zinc ores and, second, of spelter from Australia to the United Kingdom. By the ore contract, the British government could be required to take 250,000 tons of concentrates per year from June 1, 1918, to June 30, 1921, and from July 1, 1921 to June 30, 1930, it may be required to take 300,000 tons per year. In accordance with the spelter contract, in addition, the Australian Zinc Producers' Proprietary association may sell up to 45,000 tons of spelter per year to the British government at the ruling market price.

"There is thus an assured ore and metal supply for British industry. For the present, indeed, it amounts to a troublesome expense to the government, and the supplies themselves are superfluous while zinc smelting and zinc using industries are at a low ebb. At the beginning of 1922, there were on hand in Australia a stock of 786,092 tons of concentrates and 2286 tons of spelter, according to the statement made officially before parliament. World prices had then fallen below the original costs to the government to the extent that there was a book loss of over £500,000 on this transaction.

Zinc producers in Great Britain proper are protesting, asserting they cannot compete with the government. It will take at least five years, it is believed, before the use of spelter in Great Britain will absorb the supply. As Mr. Smith states, "if smelting these ores is not promoted more rapidly in the United Kingdom than it has been since the armistice, some change of government policy must be looked for eventually that may mean an adjustment of the Australian ore contract."

Societies News

WEDNESDAY evening, Oct. 25, the Engineers' Society of Western Pennsylvania extended an informal reception to Carveth Wells, noted engineer, explorer and lecturer, in the Hawaiian room of the William Penn hotel, Pittsburgh. Mr. Wells was engaged by the British government to take charge of the exploration survey of the railway from Singapore to Siam, through the heart of the Malay jungle, and was also on the survey and construction of the Grank Trunk Pacific railway in the Canadian Rocky mountains. Mr. Wells is giving a series of three lectures under the auspices of the Civic club of Allegheny county.

* * *

Meeting Date Decided

According to a recent announcement by the Ohio State Foundrymen's association the dates for the annual meeting of that organization has been decided upon for Dec. 7 and 8. The two day-sessions will be held at Middletown, O.

Convention Calendar

Oct. 27—American Iron and Steel institute, twenty-second general meeting at the Commodore hotel, New York. H. H. Cooke, 40 Rector street, New York, is assistant secretary.

Nov. 22-23—National Founders' association, fall meeting at the Astor hotel, New York. J. M. Taylor, 29 South La Salle street, Chicago, is secretary.

Summarize Labor Status in Ohio Foundries

The wage report of the Ohio State Foundrymen's association for the third quarter of 1922 shows that at the close of the period the average rate of compensation throughout the state "for nine types of foundry employes had decreased; 14 had increased and one remains unchanged." Included among those classifications where averages were reduced are journeymen iron molders, production men and apprentices; core-room production men; journeymen steel molders and apprentices, and foremen. The malleable iron molders' average wage was unchanged.

The following figures are given as the average wages, under date of Oct. 17: Journeymen iron molders 67.4 cents per hour, production men 63.6 cents, apprentices 43.5 cents; core-room journeymen 65.5 cents, production men 47.9 cents, apprentices 42.6 cents; journeymen steel molders 55.3 cents, apprentices 38.6 cents; journeymen malleable iron molders 60.2 cents, production men 64.3 cents. The average among 1496 common laborers was 37.3 cents.

Labor conditions throughout the state were more quiet during the third quarter.

In Cleveland the four shops which are operating under open shop conditions after having refused the union's demands, are making satisfactory progress. They report good production and satisfactory castings.

The union shops in Dayton which recently had a demand from the unions for an increase from $5.50 to $6 for an eight hour day have compromised on a basis of $5.75 for an eight hour day.

The following wage increases in other large foundry centers have recently been granted:

Boston: Effective Oct. 1, 1922 to Oct. 1, 1923, the minimum rate for molders and coremakers in union foundries is increased from $5.60 for eight hours to $6 for eight hours.

Chicago: Effective Sept. 1, union foundries increased minimum rate from $6.00 for eight hours to $6.50 for eight hours, with no time limit specified.

Pittsburgh: Effective Sept. 1, the minimum rate for molders and coremakers is increased from $5.60 for eight hours to $6.44 for eight hours, with 30 days' notice from either side if there is a desire to change from the present agreement.

The shortage of help is a significant feature. Some sections report a shortage of competent help while others seem to be operating fairly satisfactorily.

Living Costs Compared

(Percentage over July, 1914)

July, 1914 to	All items	Food	Shelter	Clothing	Fuel and light	Sundries
Jan., 1920	90.2	97	43	170	49	77
Feb., 1920	93.5	101	45	177	49	78
Mar., 1920	94.8	100	49	177	49	83
Apr., 1920	96.6	100	50	188	51	83
May, 1920	101.6	111	51	187	55	83
June, 1920	103.0	115	51	176	61	85
July, 1920	104.5	119	58	166	66	85
Aug., 1920	103.2	119	58	155	69	85
Sept., 1920	99.4	107	59	155	78	88
Oct., 1920	97.3	103	59	148	83	90
Nov., 1920	93.1	93	66	128	100	92
Dec., 1920	90.0	93	66	105	100	92
Jan., 1921	81.2	78	66	87	100	92
Feb., 1921	76.3	72	66	74	98	90
Mar., 1921	68.7	56	71	74	87	85
Apr., 1921	67.6	56	71	69	79	85
May, 1921	65.7	52	71	68	78	85
June, 1921	61.9	45	71	62	78	85
July, 1921	63.1	48	69	64	79	85
Aug., 1921	62.0	48	69	59	79	83
Sept., 1921	64.8	55	69	57	79	83
Oct., 1921	63.7	53	69	60	79	80
Nov., 1921	63.0	[illegible]	69	61	79	78
Dec., 1921	62.7	52	69	57	79	78
Jan., 1922	61.4	50	69	56	78	78
Feb., 1922	57.7	42	69	56	77	77
Mar., 1922	54.7	39	65	56	74	74
Apr., 1922	54.8	39	65	55	74	74
May, 1922	54.9	39	65	56	74	74
June, 1922	55.4	41	65	53	74	74
July, 1922	55.6	42	65	54	74	74
Aug., 1922	54.5	39	65	53	81	72
Sept., 1922	55.6	40	65	55	87	72

Clothing, Food and Fuel Prices Advance

Increases in costs of clothing, food and fuel are noted in the report of the National Industrial Conference board for September. The average cost of living for wage earners' families in the United States on Sept. 15, was 55.6 per cent higher than in July, 1914. Between Aug. 15 and Sept. 15, 1922 there was an increase of 1.1 points or seven-tenths of 1 per cent in the total of all items entering into the family budget. Between July, 1920, when the peak of the rise in the cost of living since 1914 was reached, and Sept. 15, 1922, the cost of living dropped 48.9 points or 23.9 per cent. The accompanying table gives further comparisons.

Steelworkers' Per Capita Earnings Lead Gains

Washington, Oct. 24.—Employment in iron and steel works was 1.9 per cent smaller in September than in August, yet the aggregate of payrolls was 7.6 per cent greater, according to the bureau of labor statistics monthly survey of industry. Forty-two industries were surveyed, 31 revealing increased employment in September and 29 larger payrolls.

One hundred and twenty-six iron and steel works reported for a half-month period. They employed 164,731 persons in September and 167,837 in August. Their September payrolls aggregated $8,858,008 and in August, $8,235,-114. The per capital earning of iron and steel workers was 9.6 per cent higher in September than in August.

In the agricultural implement industry the loss in personnel in September was 4.4 per cent and in payrolls 9.1. The automobile industry reported 0.5 per cent more employes in September but payrolls 5.7 per cent smaller. In foundry and machine shops the increase in employment in September was 10.1 per cent and in amount of payrolls 9.5. Hardware plants were employing 0.9 per cent more persons in September than in August and paying them 5.4 per cent more. In steel shipbuilding plants the increase in employment in September was 4.7 per cent and in payrolls 2.9.

"Genuine Open Shop" on Chamber's Building

Washington, Oct. 24.—The letting of contracts for construction of the new $2,500,000 home in Washington of the Chamber of Commerce of the United States is announced by Julius H. Barnes, president of the chamber. It is hoped to complete the structure within a year. The American Bridge Co. was awarded the contract for the steel.

In response to a number of inquiries, President Barnes said today:

"The chamber intends that this national home of American business shall be erected literally on the genuinely open shop plan of employment. This does not mean a closed shop against either organized or independent labor. The chamber intends that the clause in its contracts shall be carried out and applied in absolutely good faith."

Urges Lower Flux Rate

Washington, Oct. 24.—The Western Maryland railroad has filed with the interstate commerce commission a brief in support of its proposed lower rate of $1.51 per ton on limestone from western Maryland points of origin east of Pittsburgh to Beaver valley points on the Pittsburgh & Lake Erie railroad west of Pittsburgh. The rate, filed to become effective Sept. 1, was suspended when the Pennsylvania and Baltimore & Ohio railroads protested.

Americans Neglect Burma

Washington, Oct. 17.—British and Belgian iron and steel makers monopolize the Burma iron and steel market only because American makers have neglected to study market conditions and compete actively, says Consul J. P. Moffitt, at Rangoon, to the department of commerce. The British makers' study of the market is giving them the business in spite of lower continental prices.

Economics Is Factor in Industry

Society of Industrial Engineers in Convention Discuss the Necessity of Co-ordinating Economic Conditions with Business—Overproduction and Causes Considered—Material Handling Papers Presented

NEW YORK, Oct. 23.—Study of the problem of wider recognition of the industrial engineer featured the ninth annual convention of the Society of Industrial Engineers, held at the Hotel McAlpin, New York, Oct. 18-20. The large attendance, the scope of the program and the extent to which the papers dealt with practical applications of industrial engineering showed conclusively that much progress has been made recently in this field of engineering. Great emphasis was laid on the fact that it is increasingly necessary for business executives to have a comprehensive grasp of the principles of economics. In a discussion, however, as to why the industrial engineer is not recognized and accepted as are the electrical, mechanical and other engineers, it was regarded unwise to lean too much toward theory. The real end in view, it was pointed out, is the practical application of the theory.

In his opening address, President Joseph W. Roe said "The attitude of industrial executives today toward economics is strikingly similar to that of executives of two generations ago toward science and engineering." Fifty years ago, said Professor Roe, it became evident that industrial waste and mechanical inefficiency were no longer negligible. Today, with the increasing scale of production, it is becoming evident that social wastes are no longer tolerable. Where industry grows into large scale production, both employers and employes have found it to their interest to employ industrial engineers and economists to study labor conditions, costs of living and production with a view to setting up just piece rates and stable labor agreements.

"No one denies," said Professor Roe, "that there are good business men blissfully ignorant of economics. So, too, there were good business men before the application of science. But they operate by instinct and experience, both good guides but limited. They see their business from the inside. The economist sees it from the outside, in conjunction with the remote industries, the workmen, the public interests it touches—in short its social aspects. The economist used to speculate and theorize in the library. Today he is much in the field of realities, actually measuring the forces at work in society and their effects, collecting and studying masses of facts covering wide areas and long periods of time, as none but the most exceptional manager could do. He is bound to see some things the manager misses and some forces which the manager may feel but does not recognize or understand, for example, the advantages and disadvantages of specialization and division of labor, the function of the middleman and of speculation, overproduction and the relation between value and prices. Such considerations have been brought out of the realm of pure theory. They have a real bearing and permanent business success can come only through conformity to sound economic principles."

Names Factors in Overproduction

One of the subtle but major causes of overproduction, said Professor Roe, is ignorance on the part of industrial leaders as to the law of diminishing returns. "Given a number of constant factors in a production problem and also a variable one," he said. "If the variable one be increased, the resulting returns will increase in ratio which may be equal to, or greater than that of the variable factor. If, however, the variable be uniformly and indefinitely increased, the returns will fall off, at first relatively only, then absolutely, and finally will actually cease.

"For instance, given a certain plant, and capital and a production which just pays expenses. If production be increased uniformly, there being no change in the other factors, the profits will increase, at first in greater ratio than production, then at a lessening ratio, still absolutely, until they reach a maximum. Further increases of production mean an actual loss and if persisted in, a smash and a receiver. Something like this has happened untold times in the past two years. In actual practice the increase in production is not uniform. If it were there would be little danger, for the managers would see what was going on and stop in time.

"Unfortunately, it does not work out that way. Times are good, buyers clamoring, prices high and the increase is by leaps,—materials are bought, stocks are built up until suddenly the danger is realized, but often too late. A lively sense of the law of diminishing returns is the surest safeguard I know against such disaster. If all producers could be induced to work with that law in mind it would be one of the surest ways of eliminating overproduction in seasons of rising prices, and the periods of depression which inevitably follow."

"Another element of importance is the economic size for a business, to which it is desirable to expand but beyond which it does not pay to go," said Professor Roe. In this matter are involved many questions involving economics. In the field of labor relations, said Doctor Roe, the economist is invaluable. Few executives, he said, realize that many of the acute conditions they had to meet are not local but general and recurrent. He pointed out that the economist has made studies covering nominal and real wages in all the major industries and in all countries back to the middle ages. The trends of prices and the history of periodic fluctuations and their causes. Doctor Roe thought that there is a great need for more readable books on economic and social subjects, and he recommended more general reading on economics, industrial history and labor relations by both industrial executives and labor leaders.

One of the foremost contributions made in some time on the relation of economics to industry was a paper entitled "The Economic Aspect of Production," read at the convention by Ernest F. DuBrul, general manager of the National Machine Tool Builders' association. Production at all times must be developed in accordance with market conditions and when this rule is violated, wealth previously accumulated is destroyed. There is an erroneous belief that mere fabrication creates value. As a matter of fact, prices obtained measure the value to the buyer at the time of sale, not the cost to the producer. Conditions differ in different industries, said Mr. DuBrul, and proper forecasting involves the study by an industry of its own condition and their correlation with the facts of other industries. Mr. DuBrul analyzed conditions resulting from overexpansion in a given field such as the tire industry and analyzed the processes involving serious losses through which the industry has to go before the supply again is in proper relation to demand. To be successful, business policy must be quite different for the fabricator of producer goods like machinery, than the maker of consumer goods like butter.

"Industrial engineers, management engineers and above all, business managers," said Mr. DuBrul, "must study more economics than they have been complacently content to know in the past, because the aftermath of the war demands that knowledge as to price of salvation and well-being."

Arthur J. Todd, director of labor for B. Kuppenheimer & Co., Chicago, expressed the belief that we are just en-

tering the true industrial age. We have been and still are in a mechanical and commercial age. The reproach of the present day is that industry is commercialized and man has been harnessed in the process of harnessing the forces of nature. Mr. Todd thought that the real reproach was not against industry but against bankers and traders who live on the worker and producer. In the true industrial age man will become the master of machinery. In this age, he observed, man would be more precious and there would be developed a statesmanship of industry in which the worker will take a part.

Four sectional meetings featured the program. At the managing executive's group, the discussion concerned itself with matters of measuring management. Systems were described, whereby after rating equipment, methods and conditions at 100 per cent standards, the men received scores measuring their performance each day, their pay varying in accordance with their scores. It was brought out at this group meeting that whereas it usually is easy to develop methods to check up the men and that part of the management which is delegated to subordinates, it is difficult to measure the performance of executives, sales managers, office managers, etc. The difficulty in measuring the performances of these men, it was said, is their opposition to being measured.

Accountants Discuss Engineer's Work

At the accountant's group, the discussion hinged mainly upon the line of demarkation between the cost accountant and the industrial engineer. It was agreed that both must have much information in common. It was felt, however, that the industrial manager should have a broader knowledge on production technique, such as the selection of the best materials to their methods for manufacturing, whereas the cost accountant, who is concerned more with office work, need not possess so refined a knowledge. It was agreed that these men must work in common and that the engineer should depend on the cost accountant for information that will help him in the plant.

A sales manager's group meeting was devoted largely to a discussion of methods for bringing products closer to the consumer. The effect of standardization of products was regarded as advantageous, since where the dealer finds it necessary to carry fewer varieties of products, his stocks are smaller and his overhead less, thus making it possible to enlarge profits and reduce selling prices. Methods of training salesmen and dealers, as well as factory workers, were discussed.

At the industrial relation's group it was felt that there is too much disposition to look for a royal road in hiring workers. There is too much of a disposition to look for standardized methods of selecting employes, such as intelligence tests, etc. It was regarded advisable to employ sane methods of selection, and it was thought that the personal interview is the best way of arriving at a decision as to whether or not a particular man should be hired.

An interesting feature of the convention was a practical termination of the disagreement with regard to library classifications in the industrial management division. Under the Melville-Dewey decimal classification system the literature on the subject of management is divided by decimals under the number 658, but there has been some difference in practice in different libraries. The main points at issue were ironed out at the meeting and as a result, it is expected that the decimal classification of literature on the subject of management shortly will be uniform.

One of the high spots of the convention was an address at the banquet by Dr. Davis R. Dewey of the Massachussetts Institute of Technology. Dr. Dewey said that one of the reasons economics is not tied up closely enough with business, is the lack of economic literature written in readable English. His talk was a representation of the principal economic facts in simple language. Francis H. Sisson of the Guaranty Trust Co. of New York, spoke at the banquet on "Finance and Industrial Economics," and Royal R. Keely spoke on the industrial situation in Russia.

At the research committee luncheon on Friday, W. Kester reported that the New York chapter, in co-operation with the shipping board, has a movement under way to stuying the handling of cargoes on shipping board boats with a view to developing more efficient methods for handling freight, both as to labor and devices. Edward J. Kunge of Pennsylvania State college, suggested that it would be desirable to have central headquarters in each state for affording guidance to manufacturers in deciding on a suitable site for a plant. For instance, plants not only could be located where there is a labor supply, but plants which dovetail in seasonal requirements of labor properly should be located alongside each other. It was thought that the provision of properly determined rest periods for both manual and mental workers ultimately will become general in this country, and it was pointed out that various companies, like the White Motor Co. already have gone into this matter extensively and that their experience proves that rest periods result in stimulation of production. It was reported that in addition to the present eleven chapters of the society, one is about to be established in Boston and another probably will be established shortly on the Pacific coast.

James A. Faust, New York, and William Geiger of the Keretol Co., Newark, N. J., read interesting papers on "How Can We Reduce Production Costs?" Mr. Geiger represented the workers and Mr. Faust the executvies. Mr. Geiger answered the questions of executives as to how production costs can be reduced by advising better use of the worker's time. Mr. Faust said that the remedy was to be found in the creation of a commission composed of high grade specialists in financing, accounting and engineering. This commission, he said, would apply preventive measures to business, such as the Life Extension institute applies to the human body. It was pointed out that nothing was more important than the establishment of proper piece rates and that reductions in piece rates are demoralizing to the men. Charles Cheney of Cheney Bros., South Manchester, Conn., and O. L. Preble of the Eastern Casualty Insurance Co., spoke on "What Keeps Workers Contented."

Material Handling is Considered

In a special session devoted to the discussion of handling of materials, the most interesting paper was by M. R. Denison, superintendent of stores of the production division of the Studebaker Corp., at South Bend, Ind. Mr. Denison told about the various facilities and devices which have been installed at South Bend for the transporttaion of materials. The equipment for handling of materials at this plant comprises tractors and trucks which are assembled into trains. These trains are sent out on definite routes. They are sent out by a dispatcher and are expected to arrive at every station along the route at a given time in the same manner as a railroad train. At each station, the trains are broken up in order to leave certain trucks, and the train then is made up again by adding other trucks. These trains as a rule average about 50 trucks each. At the Studebaker plant Mr. Denison said raw materials are arranged in banks which are equivalent to a day's production, and the material is arranged in complete sets per car, with the tools for performing the various operations. When a man is short even a cotter pin he must show a defective cotter pin to obtain a new one or he must present a

requisition from his foreman, in which event the expense entrailed in connection with the new cotter pin is budgeted against the man.

R. A. Wentworth, who served as chairman of the meeting, said that due to the scarcity of labor since the war and to the change in metal attitude toward heavy tasks, labor is not going back to muscle work if it can avoid it. For the correction of conditions due to the labor shortage and the changed attitude of labor, industry must look toward the development of material handling methods.

William C. Hoover described the methods of handling pigments and gum at the plant of the B. F. Goodrich Co., Akron, O. M. W. Potts spoke on "Portable Elevators. Harry Carlson, Sandvik Steel, Inc. presented a paper on "Steel Belt Conveyors." T. A. Caruso, of Lehn & Fink, spoke on pneumatic tubes and W. T. Spivey, on "Gravity Conveyors."

Frank B. Gilbreth, Montclair, N. J., described and exhibited an inexpensive stereoscopic device which is being employed to advantage in studying methods. With this device it is possible to transfer the superworkmen's skill to the learner, without the superexpert being present.

Robert B. Wolf, vice president of the American Society of Mechanical Engineers, said that in order to reduce industrial waste to a minimum, industries must be so organized as to stimulate the worker's process of thinking. A. J. Lutterbach of the Palmolive Co., Milwaukee, spoke on "The Budget and the Financial Forecast." J. H. Parde, president of the J. G. White Management Corp., New York, spoke on "Economics Part in the Formation of Business Administration."

Miss Nellie Swartz of the New York state department of labor, read a paper on the elimination of unnecessary fatigue. Miss Edith Hillis spoke on observations on fatigue which she recently made in Europe. Dr. Louis I. Harris, of the New York department of health, spoke of the effects of fatigue on the human organs.

Dr. Joseph W. Roe was re-elected as president of the society. He is head of the department of industrial engineering at New York University. F. C. Schwedtman, vice president of the National City Bank of New York, was re-elected treasurer and George C. Dent, Chicago, was continued as business manager and also was elected secretary to succeed W. G. Sheehan. Vice presidents of the society will be named later by President Roe.

Railroad Needs

Depicted by Implement Makers at Chicago—Officers Are Elected

Chicago, Oct. 23.—Reasons why railroads must continue to be heavy buyers of iron and steel to bring motive power and rolling stock to a point capable of transporting business of this country were given by C. H. Markham, Illinois Central railroad, before the twenty-ninth annual convention of the National Association of Farm Equipment Manufacturers at the Congress hotel, Chicago, Oct. 18-20. Mr. Markham spoke on transportation problems, with special relation to the farm implement industry, and explained the inability to maintain equipment at an efficient level. It was said that because of harmful regulation, railroads have not earned enough money to buy sufficient equipment to replace wornout cars and locomotives. He showed that in 1912 railroads built 4212 miles of new track and in 1913 additions were 4467 miles. During the past four years the average has been only 933 miles of new track each year. Since 1916 more miles of track have been abandoned than new track built. During the 10 years ending 1917, railroads put in service an average of 2677 locomotives each year and scrapped an average of 16,969 a year. During the past four years they have added an average of only 1712 locomotives a year and have scrapped an average of 1073 a year. This indicates that to maintain service railroads have retained in service locomotives that should have been retired.

During 10 years ending 1917, railroads added an average of 120,254 freight cars each year and scrapped 82,416. During the past four years they have added an average of 59,740 new cars each year and retired 59,258. These figures explain the railroad situation and indicate that to get back to efficient operation railroads will continue to be heavy buyers of iron and steel for several years, provided they are able to raise sufficient money to buy what is absolutely needed.

Another paper presented before this meeting was by R. F. Todd, Deere & Co., Moline, Ill., on the past and future of the implement industry. Mr. Todd stated that while a greater part of the industry's liquidation is past, the coming year will not be profitable but will be on a better basis than either of preceding years. Indications are that 1924 will see the beginning of a heavy demand and a return to profitable operation. This belief was based on the present position of the farmer, whose purchasing power is better but out of line. C. S. Brantingham, Emerson-Brantingham Co., Rockford, Ill., made the statement that more money was spent by farmers for one low-priced make of automobile during the past two years than for all the agricultural implements sold in this country, indicating they could obtain money for cars even though they were holding back on implement purchases.

G. A. Ranney, International Harvester Co., spoke on European conditions, after a visit to plants of his company in Europe, but gave little hope of active business for American manufacturers in European markets until present conditions have changed. He believes the problems of Europe are working out and eventually American manufacturers will enter these markets on a large scale.

Other topics discussed at the meeting included depreciations, car distribution, simplified practice, and general condtions of agriculture and manufacturing. J. B. Bartholomew, Avery Co., Peoria, Ill., was elected president and R. F. Todd, Deere & Co., Moline, Ill., was elected chairman of the executive committee.

Car Work

Expected in Greater Abundance by Canadian Industrial Plants

Toronto, Ont., Oct. 23.—Manufacturing operations are being seriously handicapped by the nondelivery of steel caused by the car shortage. This has interfered considerably with the resumption of activity by the steel consuming industries of Ontario.

The report of the National Steel Car Corp. of Hamilton, Ont., for the fiscal year ending June 30 shows a net loss of $79,733, before providing for depreciation and interest, as compared with net profits of $422,674 for the preceding year. The capital and surplus as of July 1, 1921 was $2,820,324, which after total deductions was reduced to $2,513,950.

President R. J. Magor reported that practically no new car equipment was ordered by Canadian railways during the year, but he looks for largely increased railway traffic as a result of business revival. He regards it as probable that the railway managements are anxious to order equipment as early as finances will permit, "as labor and material prices are likely to advance for some time to come."

He stated that his company had obtained orders for repairing American railway cars but the work could not

be undertaken with profit, though the directors believed that any direct loss involved would be less than would have been experienced had the plant been shut down.

Unsettled conditions abroad have made it impossible for the company to take foreign railway equipment orders to any appreciable extent, but the development of this business is being watched and it is believed that in due time a share of the foreign market will be secured. Uncompleted orders on the books of the company, amounting to $3,000,000, were reported.

The British Empire Steel Corp. has secured an order from the Grand Trunk railway for 25,000 tons of rails of the standard 100-pound type.

Equipment to Receive Attention

That one of the first matters to receive the attention of Sir Henry Thornton, new head of the Canadian national railways, will be the equipment, is the belief of W. W. Butler, president of the Canadian Car & Foundry Co., Montreal. Mr. Butler states that in addition to the National lines, he believes Canadian Pacific is in need of considerable equipment, and orders from that source are to be expected. Recent inquiry from the Grand Trunk for 7000 cars is considered significant and Mr. Butler anticipates that within two or three months equipment companies in Canada will have received orders from the Canadian railways of no inconsiderable size. The car and foundry company is engaged on repair work on 1500 cars for the Grand Trunk railway.

For the first time in two years the Ogden shops of the Canadian Pacific at Calgary, Alta., are working at full time. The National railways are spending $250,000 at Edmonton, Alta., on the first unit of the western car-shops.

The following committee has been appointed by Harry Mills, provincial minister of mines, to investigate the iron mining possibilities of Ontario: Professors H. A. Guess and H. E. T. Haultain, university of Toronto; J. G. Morrow, manager, Steel Company of Canada, Hamilton; George Cowie, manager, Algoma Steel Works, Sault Ste. Marie; Lloyd Harris, Brantford; and a Mr. Hall, tariff and transportation expert, Montreal. It has been arranged to make a test of 43,000 tons of briquetted ore from the Moose Mountain mine at the Hamilton plant of the Steel Company of Canada. The committee will report to the government at the next session of the legislature.

Reports Cast Pipemakers Gain in Two Years

Washington, Oct. 24.—Despite the fact that 10 more establishments were making cast iron pipe and related products in 1921 than in 1919 and that the tonnage output was greater in 1919, the number of persons engaged, the cost of materials used and the value of the products all registered marked declines, according to the census bureau. The total value in 1921 was $43,899,469 and in 1919 $51,902,763. Of the 69 establishments reporting in 1921, 25 were in Alabama, 8 in New Jersey, 7 in Pennsylvania, 6 each in New York and Ohio, and 3 each in Tennessee and Virginia. The comparisons of employes, materials and output follows:

	1921	1919
Number of establishments	69	59
Persons engaged	13,352	13,777
Proprietors or firm members	4	4
Salaried employes	920	1,148
Wage earners (average number)	12,428	12,625
Salary and wage payments	$15,312,292	$17,136,610
Salaries	2,259,210	2,431,212
Wages	13,053,082	14,705,398
Contract work	2,400	37,795
Cost of materials	23,657,085	25,386,552
Value of products	43,899,469	50,235,101
Value added by manufacture*	20,242,384	24,848,549

*Value of products less cost of materials.

Detailed statistics in net tons concerning production are:

Kind	1921 Tons	1919 Tons
Cast-iron pipe and fittings*	759,554	702,554
Gas and water pipe and fittings	548,946	447,881
Bell and spigot pipe	485,396	375,203
Flanged pipe	19,626	23,791
Culvert pipe	4,651	5,657
Fittings	39,273	43,230
Soil and plumbers' pipe and fittings	210,608	254,673
All other castings	24,360	16,401

*The figures for 1919 include cast-iron pipe to the value of $1,667,662 reported by establishments engaged primarily in other lines of manufacture; the corresponding figures for 1921 are not yet available.

Determine Sensitiveness of Coal to Oxygen

The relative tendency of Pennsylvania coals to ignite spontaneously has been investigated at the Pittsburgh station of the United States bureau of mines. The research, it is stated by the bureau, consisted largely of the development of methods for determining the comparative sensitiveness of coals to oxygen. The tests were made by the bureau in connection with the Carnegie Institute of Technology, Pittsburgh.

Obituaries

LOUIS P. LINCOLN, superintendent of the beam department, Carnegie Steel Co., Homestead, Pa., died suddenly in his office Oct. 19. Mr. Lincoln had been with the Carnegie Steel Co. for the last 30 years and had risen from a clerkship. He served three successive terms as burgess of Munhall, having been elected for the third time last November. He formerly was a school director of the borough and was a member of the state republican committee. He was born at Lawrelton, Pa., Union county, Aug. 8, 1866, and was a graduate of Dickinson college, Carlisle, Pa. He located in Pittsburgh when 26 years old.

Louis Kenyon, office manager of the Woonsocket Machine & Press Co., Woonsocket, R. I., died unexpectedly in a Providence, R. I., hospital, Oct. 18, aged 32 years.

Orin Ross, 45 years old, sales manager of the Columbus Bolt Works, Columbus, O, died Oct. 12 from an intestinal infection. He had been seriously ill for three weeks. For 15 years he had been associated with the Columbus Bolt Works.

Charles A. Brayton, 47 years old, president of the Standard Car Wheel Co., Cleveland, was found dead in bed at his home in that city Oct. 15. He had been identified with the company for 20 years, having been made president following the death of his father, C. A. Brayton. Charles A. Brayton was graduated from Yale in 1899.

James A. King, former president of the King Bridge Co., Cleveland, died recently at his home in Bratenahl, a suburb of Cleveland, after a long illness. He was one of the organizers of the King Bridge Co. served it long as president and retired several years ago. Among his survivors is a son, Norman C. King, secretary-treasurer of the company.

William B. Rhodes, aged 59 years, vice president and director of the Forest Oil Co., Pittsburgh, died Oct. 20 at Sewickley Heights, near Pittsburgh. Mr. Rhodes was a director of the S. Severance Mfg. Co., Glassport, Pa., rivets; director of the Rees Mfg. Co., Pittsburgh, jacks; and director of the Iron City Products Co., and the Keystone National bank, both of Pittsburgh. He also had been connected with the Pennsylvania Tube Co. and the Apollo Iron & Steel Co.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

JOSEPH K. LARKIN, for many years senior member of J. K. Larkin & Co., New York, jobbing and warehouse merchants of iron and steel products, recently incorporated his company as J. K. Larkin & Co., Inc., and assumed the presidency. Mr. Larkin started this business under his own name in 1901, and has been uniformly successful to the point of occupying a prominent position in the field of warehouse distribution of nearly all steel and iron products.

George D. Cameron, who has been in charge of the coal department of Pickands, Mather & Co., Cleveland, has retired and after Jan. 1 will not be connected with the firm.

Charles A. Morris, associated with Borton & Borton, Cleveland, investment bankers, has been elected a director of the Steel Products Co., Cleveland, succeeding Herbert Wright, resigned.

E. T. Lovering has resigned as western foundry representative of Pickands, Brown & Co., Chicago, to take charge of western sales of foundry coke for the Atwill-Makemson Coke & Coal Co., McCormick building, Chicago.

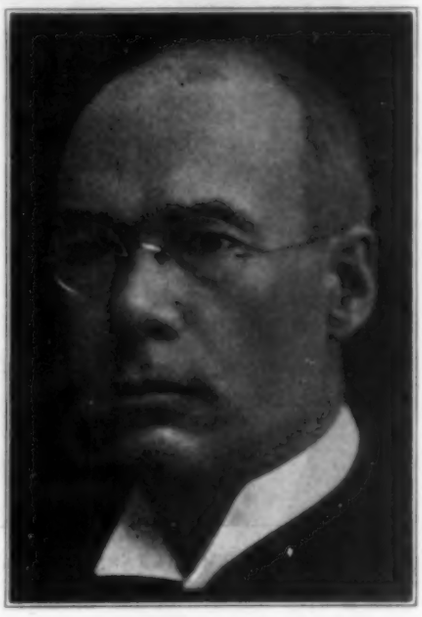
D. K. Swartwout, president of the Ohio Body & Blower Co., Cleveland, and Herman H. Lind, vice president, have resigned. N. A. Middleton of Boston has been elected to succeed Mr. Swartwout.

C. C. Strout has been appointed vice president of the Alvord Reamer & Tool Co., Millersburg, Pa. Mr. Strout has been western sales manager of the Victor Saw Works and general sles manager of the Safety Wrench & Appliance Co.

E. Donald Jerome has been appointed district sales agent in the New England territory for the Pulaski Iron Co., effective immediately. His headquarters will be at 131 State street, Boston. Mr. Jerome formerly was identified with the Bethlehem Steel Co., for which he sold pig iron in the New England section.

Henry H. Barbour, vice president in charge of sales of the Lackawanna Steel Co., Buffalo, since Aug. 1 1920, has resigned. Prior to going to Buffalo Mr. Barbour was district sales manager of the company at New York and subsequently was a vice president of the Consolidated Steel Corp. During the war he served on the priorities committee at Washington.

W. P. McKelvey, who has been in charge of sales at Philadelphia for the Lackawanna Steel Co., has been transferred to the Pittsburgh office of the Bethlehem Steel Co. O. R. Payne, formerly of the Philadelphia structural sales department of Bethlehem, has been appointed structural sales agent at Baltimore. V. B. Ellstrom has been appointed structural sales agent of Bethlehem at Buffalo. Mr. Ellstrom has been connected with the Chicago structural sales office of the company.



JOSEPH K. LARKIN

Kent Harrison, in charge of open-hearth operations at the Ashland, Ky., plant of the American Rolling Mill Co. for the past three years, has resigned to become superintendent of open-hearth operations for the Donner Steel Co., Buffalo, effective, Nov. 1. Mr. Harrison was trained in the works of the Illinois Steel Co.

Benjamin G. Lamme, chief engineer of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been awarded the Joseph Sullivant medal for distinguished work since his graduation from Ohio State university in 1888. The medal is given once in five years for some notable achievement by an Ohio State alumnus.

Henry A. Tremaine, treasurer of the Standard Equipment Co., and identified with numerous other industrial organizations, has been elected president of the Grant-Lees Gear Co., Cleveland, succeeding Richard Ferguson. Carl W. Blossom has been made a director and G. B. Collins has been elected chairman of the board.

Lee Hillard has been appointed representative of the Bethlehem Steel Co. in St. Louis territory as structural sales agent and sales engineer. For the past nine years Mr. Hillard has been connected with the Chicago organization of the Bethlehem company, prior to which he was with the Pittsburgh Steel Co. The territory within his jurisdiction will include Missouri, Kansas, Arkansas, western Tennessee and Kentucky and southern Illinois.

Alfred D. Flinn has been elected director of the Engineering Foundation, which is fostering organized industrial research on a nationwide scale. Mr. Flinn is the first incumbent of the new post, created by the foundation's governing board, composed of the four founder societies of civil, mining, mechanical and electrical engineers, to meet the expanding activities of the foundation. Mr. Flinn will retire as chairman of the engineering division of the National Research council, a position which he has held since October, 1921, but will continue as secretary of the United Engineering society. Mr. Flinn has been secretary of this society and of the Foundation since January, 1918. He is a native of New Berlin, Pa., and a graduate of Worcester Polytechnic Institute in 1893. He has been identified with municipal engineering enterprises in New York and Boston and was formerly a lecturer in Lawrence Scientific school of Harvard university. He has been connected with the Groton Aqueduct commission as general inspector on the chief engineer's staff. During 1905-1918 he was division engineer, department engineer and deputy engineer of the board of water supply of the city of New York on construction of the Catskill aqueduct and reservoirs.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

EDWARD JAMES KEARNEY, the new president of the National Machine Tool Builders association, is secretary-treasurer of the Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines and other machine tools, and a factor in other industrial enterprises. Mr. Kearney was born at Little Cedar, Iowa, April 7, 1868. He was graduated from Iowa State college at Ames in 1893. In that year Mr. Kearney went to Milwaukee, entering the employ of the Chicago, Milwaukee & St. Paul railroad in its West Milwaukee car and locomotive shops. After six months he entered the service of the Kempsmith Machine Tool Co., Milwaukee, now the Kempsmith Mfg. Co., as a draftsman. With Theodore Trecker, then also in the service of the Kempsmith company, Mr. Kearney in 1898 formed the partnership of Kearney & Trecker to manufacture milling machines. This has been developed to a large corporation with $1,000,000 capital and a trade extending to all parts of the world. The business was incorporated as the Kearney & Trecker Co. in 1906, and since 1920 has operated under the title of Kearney & Trecker Corp. During the war Mr. Kearney was director for Wisconsin of the Liberty loan campaigns. He is a member of the Wisconsin state board of vocational education, trustee of the Stout institute, Menomonie, Wis., and trustee of Milwaukee Downer college. He lives in Wauwatosa, suburb of Milwaukee.

Benjamin Jackson has been named general manager and Vin. Madden his assistant at the plant of the Sharpsville Boiler Co., Sharpsville, Pa.

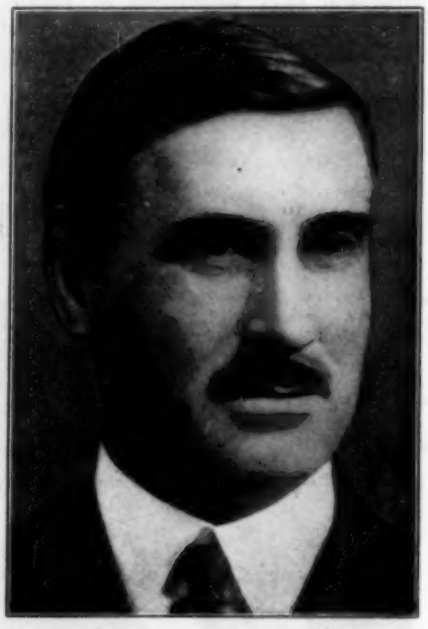
J. Lovell Johnson, president of the Iver Johnson Arms & Cycle Works, Fitchburg, Mass., has returned from a hunting trip to Nova Scotia.

W. Ward Harrison, illuminating engineer with the National Lamp Works, Cleveland, of the General Electric Co., has been elected president of the Illuminating Engineering society.

Maj. Albert Peter, has resigned from the Chain Belt Co., Milwaukee, to take the position of chief engineer and works manager of the Milwaukee Air Power Pump Co. Nov. 1.

F. C. Knight for 10 years salesman with the New England Coal & Coke Co., Boston, has joined the sales organization of Alley & Page, pig iron, coke, etc. with headquarters at 185 Devonshire St., Boston.

H. J. Stambaugh Jr., vice president and general manager of the Trussed Concrete Steel Co. of Canada, Ltd., Walkerville, Ont., has been appointed



EDWARD JAMES KEARNEY

general sales manager of the Burlington Steel Co., Ltd., Hamilton, Ont.

William G. Coxe, vice president and general manager of the Pusey & Jones Co., Wilmington, and marine consulting engineer with offices in Philadelphia, is expected to return from Europe early in November.

H. W. Cookson, for eight years with Rolph, Mills & Co., San Francisco, has resigned and has opened offices of his own at 230 California street, San Francisco, where he will handle a general line of iron and steel products as Pacific coast representative of eastern mills.

Lorenz Maisel, who recently disposed of his interests in the Madison Tool & Stamping Works, Madison, Wis., which he organized in 1919, has become interested in the Allan-Diffenbaugh Wrench & Tool Co., Baraboo, Wis., and on Oct. 1 took charge as general manager. From 1910 to 1919 Mr. Maisel was development engineer of the Burgess Battery Co., Madison, then known as the Burgess Mechanical Laboratories Co.

Louis W. Byrne, 218 Metropolitan tower, New York, has been appointed sales manager of the Wilmarth & Norman Co., Grand Rapids, Mich., manufacturers of grinding machinery. Mr. Byrne formerly was connected with Burton Griffiths & Co. Ltd., New York city.

Charles B. Wilson, vice president and general manager of the Willys-Overland Co., Toledo, O., has resigned to return to Pontiac, Mich., as active president of the Wilson Foundry & Machine Co., of which he was president and general manager until his active affiliation with the Willys organization late in 1920.

E. W. Smith has been appointed general superintendent of motive power of the southwestern region of the Pennsylvania railroad with headquarters at St. Louis. Mr. Smith, who was engineer of transportation, succeeds W. C. A. Henry, who becomes engineer of transportation with headquarters at Philadelphia.

Homer D. Williams, president of the Carnegie Steel Co., has been elected a member of the board of education at Pittsburgh. Mr. Williams, whose term on the board is for six years, is a member of the state council of education and a trustee of the University of Pittsburgh and of the Carnegie Institute of Technology.

G. A. Bishop of the Anchor Post Iron Works has been named temporary president and A. P. Armstrong of the Euclid Crane & Hoist Co. has been named temporary secretary and treasurer, both of the Euclid Chamber of Industry, a new association formed at Euclid, suburb of Cleveland.

J. B. Clark Jr. recently became associated with the Pennsylvania Crusher Co. as sales engineer, and will make his headquarters at the company's New York office, Hudson terminal, 50 Church street. For a number of years Mr. Clark has been associated with the Koppers Co., Pittsburgh, in the erection and operation of by-product coke plants.

Republic Iron Loses from Summer's Strikes

Compared with a net profit of $86,382 reported for the second quarter of 1922, the Republic Iron & Steel Co. emerged from the strike-ridden September quarter with a deficit of $138,675. This showing indicates the heavy burden placed upon the steel industry by the labor struggles in the coal mines and on the railroads.

Up to the beginning of July 1, when the shopmen's walkout complicated the coal shortage situation, the company's profits were increasing. During July and August Republic operated only one blast furnace out of six in the Youngstown district. But one-third of its open-hearth furnaces were active and at one time all of its sheet mills at Niles, O., were closed. The comparative income account for the period follows:

	1922	1921
Net profit*	$395,756	†$1,060,747
Other income	.....	23,004
Profits	395,756	†1,037,743
Depreciation and renewals	252,338	137,779
Exhaust of minerals	49,886	28,569
Bond interest	232,228	194,319
Deficit	138,676	1,398,410
Preferred dividends	.....	437,500
Deficit	138,676	1,835,910

*After deducting charges for reparation and maintenance of plants. †Loss.

Following is a comparison for the first nine months of 1921 and 1922:

	1922	1921
Net profit*	$681,745	†$1,098,952
Other income	.....	129,132
Profit	681,745	†969,820
Depreciation and renewals	655,769	491,251
Exhaust of minerals	131,591	113,569
Bond interest	658,761	602,832
Deficit	764,376	2,177,472
Preferred dividends	.....	1,312,500
Common dividends	.....	450,000
Deficit	764,376	3,939,972

*After deducting charges for reparation and maintenance of plants. †Loss.

The report shows unfilled orders for finished and semifinished steel slightly higher on Sept. 30 than on June 30. These orders at the close of the second quarter totaled 196,886 tons while at the end of the third quarter they were 199,431 tons.

Even since the close of the third quarter covered by this report, operating conditions have so improved that today the outlook is exceedingly encouraging for stockholders.

The Republic Iron & Steel Co. now is operating four out of its six blast furnaces in the Youngstown district and two out of its three stacks in Alabama. All open-hearth furnaces are operating, its bessemer plant is on and its tube mills are busy. All of the company's sheet mills are operating and the company's books are full of business.

To Increase Capital

Shareholders of the American Machine & Foundry Co., formerly a subsidiary of the American Tobacco Co. formally have approved a proposal to increase the company's capital stock from $2,000,000 to $10,000,000 through the issuance of 80,000 shares of additional $100 par value stock. According to a letter sent the stockholders some time ago, part of the increase in stock will be distributed as a stock dividend and the remainder held in the company's treasury.

Pittsburgh Steel Net Less

The net income of the Pittsburgh Steel Co. for the year ended June 30 was $861,883, after charging off for depreciation and depletion $866,000, reduction of inventory values $65,000 and including in operating costs $1,547,000 for maintenance, repairs and replacements. The net in 1921 was $1,722,526.

Total sales for the year were $15,866,000, being a reduction of $7,364,000 from the previous year, mainly due to reductions in prices of commodities and not to tonnage of sales, while the amount charged to depreciation and depletion was but $119,000 less than last year.

The company's strong financial position is indicated by the fact that current assets of $12,871,000.00 are reported against current liabilities of only $1,933,000.00. After payment of dividends on preferred and common stock there was a deficit for the year of $433,116.

Virginia Iron Gains

Gross earnings of $402,714 are reported by the Virginia Iron, Coal & Coke Co. for the quarter ended Sept. 30. This compares with $201,782 for the quarter ended June 30. After interest and taxes net earnings totaled $273,886, equal after preferred dividends to $2.11 a share on $10,000,000 common. This compares with $95,959, or 33 cents a share, in previous quarter. Income account for nine months ended Sept. 30 last showed net earnings of $288,799, or $1.01 on common after preferred dividends.

To Auction Steel Plant

Property of the Cromwell Steel Co., Lorain, O., will be offered at public auction at the courthouse, Elyria, O., Nov. 22. The plant consists of four 90-ton open hearth furnaces, soaking pits, one 20-ton hammer, one 30-inch two-high two-stand reversing bar mill and auxiliary equipment, in addition to about 300 acres of land, with a total appraisal of $1,650,000. C. A. Orr, 724 Guardian building, Cleveland, is special master commissioner.

The plant of the Cromwell Steel Co. is comparatively new having been built in 1917 and first put in operation in August of that year. It was built by John C. Cromwell of Cleveland and associates. It has a rated capacity of 200,000 tons of ingots and 150,000 tons of rolled products annually.

Spot Business

Improves in Coke By-Products Market —Quotations Unchanged

New York, Oct. 24.—Scarcity of empty tank cars is tending to offset the effects of increased production in the shipment of light oil distillates. Spot business is improving, but it is still so small in the aggregate that it is hardly to be regarded as a market factor. Most sellers are refusing to consider business for shipment before Nov. 15.

Quotations are unchanged as follows: Pure benzol, 30 cents ovens, in tanks, and 35 cents in drums; 90 per cent benzol, 27 cents in tanks and 33 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; commercial xylol, 29 cents in tanks and 34 cents in drums and pure xylol, 30 cents in tanks and 35 cents in drums.

Phenol for nearby shipment is being quoted at 20 to 22½ cents. There is little or no contract business in this description. The market on naphthalene in flakes and balls continues nominal.

Trading in sulphate of ammonia continues with prices holding nominally at $3 to $3.05, works, on business for domestic account and $3.55 to $3.60, port, in double bags, on export.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	(nominal)	$0.30
Toluol	(nominal)	0.30
Solvent naphtha	(nominal)	0.27
Commercial xylol	(nominal)	0.29

Per Pound at Producers' Plants

Phenol	$0.20 to $0.22½
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.00 to $3.05

Contract

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia (12 months)	$3.00 to $3.05

Germans Protesting Rail Rates

Manufacturers Asking Government When Economies Will Be Effected, Making Unnecessary Increases for Every New Wave of Monetary Depression—Export Duties Also Raised—Coal Higher—State of Mark Dominates Situation

European Special Service

BERLIN, Oct. 14.—The state of the mark continues to dominate German industry. Increasing costs and duties, resulting in higher selling prices, still are the principal factors with which iron and steel companies contend. Those which have works located near mines are protesting against the fact that railway rates make no allowance for transportation under a distance of 10 kilometers (about 6 miles).

The recent average increase of 50 per cent in railway rates has created much dissatisfaction. As usual, traffic for distances under 100 kilometers is hardest hit and particularly that under 10 kilometers which is the minimum tariff distance. This affects the works which with a view to reducing costs were established within a few kilometers of mines or acquired mines in their vicinity. The minister of communications declares that it does not pay to base the tariff on the actual distance when goods are carried less than 10 kilometers. Against this it is pointed out that the state railway's rates for carrying goods over private branch lines for all distances under 10 kilometers are relatively much less for the shorter distances. If these rates are fixed on a remunerative basis, as presumably they are, why, it is asked, should not the general tariff be fixed on a similar basis?

The rate commission has been instructed to inquire into the rates to determine whether particular classes of goods are unduly burdened from a competitive point of view. Meanwhile, car shortage is becoming more accentuated, so that increased rates may be expected to be accompanied by decreased efficiency. Shippers continue to ask when the administration means to carry into effect such measures of economy as will make it unnecessary for every wave of monetary depreciation and rising prices to be more than made good by a fresh turn of the railway tariff screw.

Export Duties Increased

Export duties have been raised, effective Sept. 3, by 50 per cent, as a whole. On certain goods the increase is 30 per cent. A number of articles are exempted. The increase was imposed by the government in opposition to industrial and commercial interests and without consultation with experts on the subject. The government has undertaken to consider a modification of the duties in cases where it can be proved that too heavy a burden is imposed.

The gold premium on customs duties was advanced to 28,900 per cent for the week ending Sept. 12 and to 33,900 per cent for the week ending Sept. 19.

The increase in wages and the cost of working materials has necessitated a further important advance in the price of coal. Dating from Sept. 1, the Rhenish-Westphalian Coal syndicate's price for bituminous pit coal has been fixed at 4027 marks as compared with 1484 marks in the middle of August.

Many iron and steel firms which recently took contracts for reconstruction work at fixed prices have been required, owing to the depreciation of the mark, to apply for additional allowances to the reconstruction commissioner. In future such applications will be considered by the commissioner only if very complete and officially certified vouchers are submitted. The particulars required comprise: A balance sheet and profit and loss account, full details of the labor employed and wages paid, particulars of orders to sub-contractors and payments made on their account, particulars of general expenditure and of cost prices. To obtain consideration it also is necessary that applications for concessions shall be made during the execution of the contract and not after its completion.

Becker Steelworks Report

The annual report of the Stahlwerk Becker Aktiengesellschaft, Willich bei Krefeld, for 1921-22 states that during the year the installation of the most modern equipment in all the works was completed. Although business was active throughout the year, the coal shortage prevented the company from working at full capacity. Considerable quantities of English coal had to be used and lignite was employed to a greater extent than before. The capital was increased from 60,000,000 marks to 100,000,000 marks. The company's mines at Bochum and Herbede were transferred to the Becker Coalmining Co., Bochum. The net profit was 37,000,000 marks, as against 15,250,000 marks in 1920-21.

The capital of the new "vertical trust" organized by Otto Wolff, the ironmaster of Cologne, to which reference has been made from time to time, is 684,000,000 marks, and this is to be increased to 984,000,000 marks. The combination includes coal and iron ore mines, iron and steel works, machinery and electrical manufacturing works, electric light and power plants, transmission lines, and gas plants. It is considered a formidable rival of the Stinnes group, "Rhein-Elbe-Siemens-Schuckert-Union," capitalized at 1,138,000,000 marks.

The nucleus of the coal and iron interests of the new combination is the Phoenix Corp., which owns and operates coal and iron mines in conjunction with its iron and steel works. The controlling heads of the corporation are Wolff, the industrialist von Hansel, and the Royal Dutch Iron and Steel Works. The Phoenix Corp. controls eight other companies, including iron and steel tube works, manufacturing plants and a shipping company. The Rheinstahl Corp., owning coal mines and iron and steel works has been linked up with the new combination. Wolff is the dominating factor in the Rheinstahl Corp. This corporation in turn owns three-quarters of the Arenberg Corp., with coal mines and iron works in Essen, and controls four other concerns. Thirteen gas and electrical works are in the merger.

Investigates Action of Steam on Coke

The action of steam on coke, with regard to reduction of the sulphur content of the coke, is being studied at the Pittsburgh station of the United States bureau of mines. At the Urbana, Ill., station of the bureau, a study is being made of the equipment and methods used in screen sizing of coal and coke, metalliferous ores, stone, gravel and various mineral products. The design, operation and advantages of various types of screening machines are being looked into.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

GEORGE M. THOMPSON, who retired recently as vice president and general manager of the Wickwire Spencer Steel Corp., Worcester, Mass., is erecting a steel rolling mill plant in the Dorchester district of Boston which, it is said, is to be operated in conjunction with the Tubular Rivet & Stud Co., Boston. It is expected a company will be organized to carry on a general wire manufacturing business. The plant, work on which already has been started, will consist of a brick,, 1-story and basement, 60 x 115-foot mill building; reinforced concrete, metal, with steel frame, 1-story, 50 x 150-foot storage manufacturing building, and a 1-story, 25 x 35-foot storage building. Allan L. Cowperthwaite, foreman at the Goddard Works of the Wickwire Spencer Steel Corp., is expected to be appointed superintendent of the new steel plant.

* * *

FORMERLY at Norwich, Conn., the C. Oscar Tracy Co. now is located at New London, Conn., and is engaged in the production of all kinds of castings of brass, bronze and aluminum for the jobbing trade.

* * *

MOLDING and coremaking departments of the Advance Foundry Co., Dayton, O., are being enlarged, the company announces. New buildings and new equipment are being provided for both departments which will increase the output. The company specializes on gray iron and semisteel castings. Anthony H. Kramer is president and general manager, George A. Engle is vice president and Alfred W. Schneble is secretary and treasurer.

* * *

FORMATION of a service department in connection with its engineering division is announced by the Alvord Reamer & Tool Co., Millersburg, Pa. This department is under direction of A. M. Lindsley, chief engineer, and will provide consulting service in connection special tool equipment.

* * *

INCREASED demands for steam have caused the Minnesota & Ontario Paper Co., International Falls, Minn., to equip each of their 12 326-horsepower horizontal return tubular boilers with stokers manufactured by the Westinghouse Electric & Mfg. Co., East Pittsburgh. The equipment consists of three retorts per boiler with double dumping ash grates of the new model type. Each two stokers are driven by a Westinghouse vertical reciprocating steam engine.

* * *

BETWEEN $200,000 and $250,000 will be invested in a new tire and rubber factory at Milwaukee by the Rauschenberger Tire Co. of Akron, O., according to announcement by Carl Heim, attorney, who has sold a 5-acre industrial site on the Chicago & Northwestern line in Granville township to these interests. A 3-story reinforced concrete factory building, 175 x 300 feet, will be erected during the winter and spring months. The company guarantees to employ not less than 250 men on a yearly average.

* * *

A NEW manufacturing and warehousing group costing $350,000 is being erected at Crandon, Wis., by the Vulcan Last Co., Portsmouth, O., in place of the plant which was destroyed by fire recently, entailing a loss in excess of $600,000. This plant is the main source of supply of raw and semifinished materials for making shoe lasts for finishing plants in St. Louis, Cincinnati, Portsmouth and Boston. In recognition of the large shoe production market of Wisconsin, it is planned later to add a finishing plant to the Crandon works and another in Milwaukee.

* * *

THE plant and business of the bankrupt Jorgenson Mfg. Co., Waupaca, Wis., manufacturing brass castings, priming devices and other specialties for the automobile and plumbing trades, has been sold to the Acme Brass & Metal Works, Inc., organized with a capital stock of $75,000 by Waupaca and Appleton capital. The new organization has been perfected by the election of these officers: President, J. M. Brown, Appleton; vice president, Lewis Larson, Waupaca; secretary, E. W. Nelson, Waupaca; treasurer, C. J. Pommer, Waupaca; directors, B. C. Koepke, Appleton, and S. K. Wood, sales manager, Waupaca. The plant has been reopened and has satisfactory orders beyond the conservative capacity to be employed at the start.

* * *

CHANGES in agencies of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., have been announced. These include appointment of Frederick D. Dimmick, 501 Frankling Bank building, Philadelphia, as exclusive agent for this company in New York territory. Mr. Dimmick for the past 10 years has been agent in Philadelphia territory for the company. In the new district he succeeds the Devevoise-Anderson Co. The Atwill-Makemson Coke & Coal Co., McCormick building, Chicago, has been appointed exclusive sales representative of the Sloss-Sheffield by-product foundry coke formerly handled by David Evans & Co., Chicago.

* * *

MANUFACTURE of motor trucks truck axles and parts will be resumed within a short time by the Appleton Motor Truck Co., Appleton, Wis., which has been incorporated with a capital stock of $50,000 by a group of local capital which recently bid in the property of the defunct Reliance Motor Truck Co. In addition to building motor trucks, the new company will manufacture a line of farm implements, including a check-row potato planter. A. G. Brusewitz, Black Creek, has been elected president; John Heehan, Greenville, vice president; William Geenen, Kimberly, secretary; Matt Rossmeissl, Appleton, treasurer. Harry Leppla and W. J. Jamison, Greenville; Frank Tremel and W. P. Tremel, Denmark, were elected directors.

* * *

THE Lakewood Foundry Co., Templar avenue, Lakewood, O., manufacturer of foundry parts for the Templar Motors Co., Lakewood, has been placed in the hands of T. L. Hausman as receiver upon complaint of the City Ice & Fuel Co., the Banner Mfg. Co., and the Burrows Bros. Co., Cleveland. Mr. Hausman is receiver for the Templar company, being named to both receiverships by Federal Judge D. C. Westenhaver at Cleveland.

Old Range Ore Rates "Too High"

Examiner for Interstate Commerce Commission Recommends Re-establishment of Differential Under New Range Rates—Railroads Controlled by Steel Corporation Held To Be Making Fair Charges

WASHINGTON, Oct. 24.—Re-establishment of a differential for old range iron ore under new range ore is recommended by an examiner for the interstate commerce commission in a tentative decision in the Adriatic Mining Co. case. The present rate of 91 cents per ton from the Mesabi, Cuyuna and Vermillion ranges to Two Harbors and Duluth, Minn., and Superior and Allouez Bay, Wis., is found reasonable, but a reduction of 9 cents to 82 cents per ton, is urged on ore from the Gogebic range to Ashland, Wis., and from the Marquette and Menominee ranges to Escanaba, Mich. A reduction of 1 cent, from 65 to 64 cents per ton, is prescribed on ore from mines at Ishpeming and Negaunee to Marquette, and a cut of 2 cents, from 75 to 73 cents per ton, on ore from other mines to Marquette. In all of the foregoing rates the dock charge is included.

The recommendations of the examiner are subject to review by the commission, but acceptance of the examiner's report is the rule. The complaint was filed on Dec. 24, 1920, by 87 upper lake independent ore companies against all of the carriers transporting ore from the mines to the upper lake ports. When the Michigan carriers in February, 1921, increased their rates to a parity with the rates from the new ranges, a supplemental petition was filed. The original complaint asked for the establishment of new and lower rates based upon a reasonable return to the carrier, but with the increases in old range rates the case took on another aspect. Sixty cents was declared to be ample from the new ranges.

The report of the examiner harks back to the rate situation in 1916. Then the rate and dock charge from the new ranges was 55 cents per ton, and from the old ranges to Ashland and Escanaba 45 cents. On July 28, 1917, the new range rate was raised to 63½ cents and the old range rate to 51 cents. General order No. 28, on June 25, 1918, increased the new range rate to $1 and the old range rate to 85 cents. Then on Feb. 25, 1921, came the increase in the old range rate making it $1. The general rate reduction of last July, brought both the new and old range rate down to 91 cents. The specific recommendation of the examiner states that the commission should find:

"1. That the rate (including charge for dock service) from the Mesabi and the Vermillion ranges to vessels at Two Harbors, Duluth and Allouez Bay and from the Cuyuna range to vessels at Superior is not unreasonable, unjustly discriminatory, or unduly prejudicial or preferential.

"2. That the line-haul rate from the Gogebic range to Ashland and from the Menominee ranges to Escanaba is, and for the future will be, unjust and unreasonable to the extent that it exceeds or may exceed 72 cents per gross ton.

"3. That the line-haul rates from the Marquette range to Marquette are, and for the future will be unjust and unreasonable to the extent that they exceed or may exceed 54 cents per gross ton from mines at Ishpeming and Negaunee and 63 cents per gross ton from others mines.

"4. That the charge of 10 cents for dock service now in effect at Ashland, Escanaba and Marquette is not unreasonable."

Corporation Roads Upheld

Because of its ownership of the Duluth, Missabe & Northern and the Duluth & Iron Range railroads, which hauled 42 per cent of the tonnage of dock ore from the Lake Superior region in 1920 and 55 per cent in 1921, the United States Steel Corp. was a defendant in the case. The examiner's report sustains the rates now charged by the corporation roads and urges reductions on the other road owned by a steel interest, the Lake Superior & Ishpeming, which is a Cleveland-Cliffs Iron Co. interest. The protesting ore producers complained that a 6 per cent return would have netted the corporation roads $3,699,463 in 1920 whereas they earned $10,904,775 on a combined book value of road and equipment of $61,657,712. The excess income above a 6 per cent return for the period 1912-20 was estimated by the protestants as $63,313,577, of which, the report states, the protestants asserted "approximately one-half, or $30,000,000, was contributed by the independent iron and steel manufacturers to the profits of the corporation."

The evidence submitted by the two corporation roads was in refutation of the charge of discriminatory and preferential rates in favor of the corporation, but otherwise the roads themselves took no part in the proceedings. It was pointed out that while the independent ore operators produced more than 48 per cent of the ore output of the upper lake region in 1920 they accounted for only 30.63 per cent of the Iron Range railroad's tonnage and 12.63 per cent of that of the Missabe. The co-ordination of corporation facilities was cited as requiring relatively less use of the carriers' facilities than the independents. On the ground of ownership the tentative report says:

"Control of a carrier through stock ownership by an industrial corporation, which is its principal shipper, is not prohibited by the interstate commerce act. Though the exaction of exorbitant rates by such a carrier might clearly tend to restrict free competition and foster monopoly in much the same manner as the practices made undawful by the second and third sections of the interstate commerce act, the question presented under such circumstances is primarily the reasonableness of the rates."

The Soo Line, Northern Pacific, Great Northern, North Western and the other defendant ore carrying roads submitted a great volume of testimony to show that present rates are not unreasonable, that operating, maintenance and repair costs are extremely high, and that the independent ore producers figure erroneously in asserting that 70 cents per ton would have been an ample charge in 1920 and because of reductions in costs 60 cents would be sufficient at this time. The tentative report states:

"It would be impossible to sustain complainants' contention that 'the key rate' to which all other iron ore rates in this territory must be adjusted is the rate over the Duluth & Iron Range raliroad and the Duluth, Missabe & Northern railroad without assuming that the costs of those roads are fairly representative of all the Minnesota roads, for in the Lum case the commission said that where a number of carriers participate in traffic at the same rate but with varying costs of transportation its policy was not to take either the lowest or the highest cost as the standard. The validity of such an assumption is doubtful in the light afforded by this record.

"The commission's finding in the Lum case that the cost of transportation of the Great Northern could

not be widely different than that of the Iron Range and Missabe was predicated, it should be remembered, on similarity in tonnage, and, as has been shown, the spread between the combined ore tonnage of the latter roads and that of the Great Northern grew from about 4,000,000 tons in 1912 to nearly 15,000,000 tons in 1920. It also seems clear that other changes which have taken place since 1912 have tended to increase the costs of the Great Northern as compared with Steel corporation roads.

"The rate of $1 in effect from the Minnesota ranges in 1920 was but 82 per cent higher than the rate of 55 cents established in 1915 by order of the commission in the Lum case, though according to complainants' own estimates the cost per ton of the Great Northern, Missabe and Iron Range had increased from $23.57 cents in 1916 to 50.98 cents in 1920, or more than 116 per cent. Complainants' rate of 69 cents, estimated as a reasonable maximum for 1920, is 100 per cent higher than their similarly computed rate of 34.75 cents for 1916. It is urged by complainants that with the return of peace they are entitled to a removal of what they term war-time emergency increase in these rates.

"While complainants' rates were subjected to a greater increase under general order No. 28 in comparison with other commodities, that inequality has been entirely wiped out by subsequent readjustments. As the result of general increases and reductions since June 24, 1918, the general level of rates in western territory is 52 per cent higher than it was on the date mentioned, while the net increase in ore rates from the Minnesota ranges during the same period has been but 44 per cent. Ore rates shared in the general reduction of July 1, 1922, and the cut then ordered seems to have been fairly proportionate to the decreased costs of operation. Further reductions in operating expenses in the immediate future seem unlikely in view of the present trend of costs of labor, fuel and construction materials."

Concerning the rates to Ashland and Escanaba the tentative report says in part:

Even though it be granted that the Ashland-Escanaba adjustment, considered as a rate group, is anomalous, it is obvious that the mines on the Menominee range do constitute a typical rate group, strikingly illustrative of the advantages flowing from this mode of rate making. The group has been in existence for 23 years, and its continuance is desired by both the carriers and the Menominee operators. While the upper Menominee ore traffic is manifestly not so profitable as that from the Gogebic range or lower Menominee mines, it does not appear that any burden is thereby cast on Gogebic ore or any other class of traffic. *** The record fails to show that the maintenance of the Escanaba-Ashland parity results in the imposition of unreasonable rates on intervenors (Steel & Tube Co. of America and others).

"The rate of 85 cents in effect to Ashland and Escanaba in 1920 does not appear to have been too high. *** The increase of February, 1921, which brought the total charge up to $1 made that charge 96 per cent higher than it had been in 1917. This action made the net increase subsequent to that date highly disproportionate to the increase on general traffic in western territory in the same period, as well as to the increase in the rate on dock ore from the new ranges, and for the first time in history the Ashland-Escanaba rate was equalized with the rate from the Minnesota mines. Though defendants freely acknowledge that the burden of justifying the increase rests on them, neither in their evidence nor in any brief do they specifically refer to any of the reasons upon which they acted.

"The increase of 10 cents per ton in the line-haul rate to Escanaba and Ashland made in February, 1921, does not appear from the evidence adducted by defendants to have been warranted. While there was undoubtedly a sharp increase in the operating costs per ton in 1921, due to the abnormally low tonnage in that year, it would be fully as unfair to base a rate for the future on that tonnage as on the volume of traffic which moved in 1920. The 1920 line-haul rate of 80 cents, reduced 10 per cent, would be 72 cents, and that amount would seem a reasonable maximum for the future. *** It appears that the present charge of 10 cents per ton for dock service at Ashland and Escanaba is not unreasonably high."

Concerning the Marquette rates the tentative report states in part:

"The reasonableness of the South Shore's dock service charge at Marquette, is not questioned by complainants' witnesses and is supported by the figures showing the cost of this service at Escanaba and Ashland. It is also inferable that the Ishpeming's dock service at Marquette costs about the same as that of the South Shore. With respect to the line haul rates of the lines serving Marquette it will be observed that the increase of February, 1921, made those rates 118 per cent higher than they were after the 15 per cent increase of July, 1917. This total increase was larger than was made in the same period in any of the other ore rates involved in this case and was excessive in comparison with the increases made in general traffic. No sufficient reason for the 5 cent increase of 1921 in the line haul rates to Marquette appears of record. Had that increase not been been made, those rates would now be 54 and 63 cents. The record indicates that those amounts would be reasonable maxima for the future."

File Higher Scrap Rates

Washington, Oct. 24.—The interstate commerce commission recently suspended the tariffs by which railroad freight rates on scrap iron and steel from Cairo and Metropolis, Ill., to St. Louis and East St. Louis, and from St. Louis and East St. Louis to Cairo, Metropolis, Brookport and Thebes, Ill., were to be increased from $1.64 to $1.89 per bross ton as of Oct. 16.

Produce Pig Iron from Steel Scrap on Coast

Concerning the production of cast iron by the use of steel scrap in the electric furnace the federal bureau of mines states:

"As is well known, pig iron is not produced on the Pacific coast at the present time in sufficient quantities to meet the demand for iron of such grades as are required for foundry purposes. As a result, foundry iron is costly, due to high freight rates on eastern iron that is brought in and to the high cost of coke suitable for use in the cupola. On the other hand, considerable steel scrap is to be had, and, for that reason, attention has been recently given by the members of the electrometallurgical section of the Northwest station of the bureau of mines at Seattle, to the problem of determining the best conditions for the production of cast iron by melting scrap steel in the electric furnace. These conditions were established by numerous experiments conducted in a laboratory furnace holding 300 pounds of metal.

"Later on these conditions were applied in a local foundry with excellent results. Low-grade miscellaneous steel scrap was melted and carburized in a 3000-pound, direct-arc, 3-phase electric furnace and the resultant metal discharged into the pouring ladle and then into the molds for the miscellaneous gray iron castings which made up the normal output of the foundry. The carbon and silicon content of the product was under control at all times and the furnace operator had no difficulty in producing the grade of iron required. Satisfactory castings were made with the normal consumption of power and electrodes."

Shows Reduction in Output of Freight Cars

Washington, Oct. 24.—Freight cars manufactured in 1921 numbered 49,026, valued at $136,393,292, compared with 153,054 valued at $369,090,445 in 1919, states the census bureau in a detailed report on the car building industry. The decrease in 1921 from 1919 in number of cars built was 68 per cent and in value 63 per cent.

One hundred and five establishments were making steam railroad cars, freight and passenger, in 1921 against 99 in 1919. The number of employes was 49,813 in 1921 and 58,782 in 1919 with salaries and wages aggregating $79,310,148 in 1921 and $92,030,039 in 1919. The cost of materials used was $195,545,545 in 1921 and $356,084,545 in 1919. The total value of all products was $314,394,867 in 1921 and $538,222,831 in 1919.

Electric railroad car builders numbered 10 in 1921 and seven in 1919. Employes totaled 3356 in 1921 and 3286 in 1919, with salaries and wages amounting to $4,334,934 in 1921 and $4,984,941 in 1919.

Large Tool Orders Are Lacking

Machinery Buyers Confining Purchases to Single Units—Prospective Demand, Especially from the Railroads, Is Large—Prices Are Strong at the Higher Levels—Crane Purchases Are Limited

EQUIPMENT demand continues confined to single unit orders in the majority of instances. While prospective business, especially from the railroads, looms large, actual buying is not of sizable proportions and only here and there have sales been noted involving more than one machine. However, as these single tool orders are numerous, the volume of business is fairly large and is expected to continue to grow as increasing shop operations create a demand for replacement tools. Machine tool building shops today are working at a greater capacity than at any time in the past two years.

While secondhand machinery still is favored by buyers due to the growing scarcity of this class of equipment, many users are being forced to accept new tools. Prices for the latter are exceptionally strong and while prices on most lines have been advanced during the past few months, higher levels are expected before the end of the year. Higher prices also are being asked for secondhand tools and dealers are making every effort to keep their stocks complete. Auction sales are being well attended and some high prices developed. One auction of interest is that of 210 machines at the plant of the Hartford Automatic Parts Corp., Hartford, Conn.

Interest continues centered in the machinery and equipment requirements of the railroads. The Pennsylvania, Missouri, Kansas & Texas, the Bangor & Aroostook, and the Burlington railroads are among a number which are expected to make large purchases shortly. The Baldwin Locomotive Works and the Rock Island railroad have been among buyers of railroad tools within the past few days. General industrial inquiry is large but is made up principally of requests for single tools. Among the larger inquiries is one from the Carnegie Steel Co. for 10 machines and one from the National Tube Co. for 14. Industrial buyers of size include the General Electric Co. Vocational schools are still buying and probably the greatest amount of orders is coming from the automotive and allied industries.

Crane buying is not spirited. However, considerable business is pending and new inquiries are constantly coming into the market. Early action is expected on the 41 cranes for the proposed Gary tube mill, which have been pending for some time.

Equipment Buying Volume Is Being Maintained

NEW YORK, Oct. 24.—Activity in the eastern machine tool market centers principally on the requirements of the Pennsylvania railroad, which involves more than 80 tools and machines. The largest reported order against this list thus far calls for $35,000 of steam hammers. Eastern manufacturers also are figuring actively on a number of tools still pending for the Missouri, Kansas & Texas. The list involved more than 175 machine tools. Eastern railroads, aside from the Pennsylvania, are doing little buying.

Industrial buying includes further purchases by the Baldwin Locomotive Works, Philadelphia, which has increased its original list.

Considerable used equipment continues to come out. The latest offering of size includes 210 machine tools at the plant of the Hartford Automatic Parts Corp., Hartford, Conn. The Durant Motor Co., which several weeks ago purchased the Willys plant at Elizabeth, N. J., is also having a number of machines placed on the market.

Crane buying during the past week has been rather light, although a good number of projects are pending and the market, generally, is fairly promising for new business. The Pennsylvania order, reported last week as placed with Niles-Bement-Pond Co., involves between $225,000 and $250,000.

Improvement in Demand Continues

CLEVELAND, Oct. 24.—Dealers in machine tools in this district continue to report demand increasing. While orders, in the main, still are confined to single tools, these are quite numerous. In fact, one dealer reports that so far this month he has received enough individual orders to make up for the loss in demand experienced in September. The automobile and automotive parts industries appear to be doing the most of the buying. Other industries are contributing their share of orders but in comparison these are few. General industrial plant operations are steadily improving and a steady demand for replacement purposes is expected the remainder of the year.

Secondhand equipment continues to be the favorite of buyers although due to the growing scarcity of this class of equipment many buyers are forced to take new tools. Used machinery dealers are making every effort to keep their stocks complete and as a result auctions of equipment are being well attended and some good prices being developed. Some interest is being shown in the auction by the shipping board at Hog Island, scheduled for Nov. 1. A number of local dealers are expected to attend. In line with the rise in new machinery prices, which now are from 10 to 15 per cent above those of last summer on most lines, used machinery prices are stronger and even higher prices are expected to be developed before the end of the year. Machine tool building shops are steadily increasing operations and today practically all such plants are operating greater shop capacity than at any time in the past two years.

There is practically no railroad buying being done in this district aside from a single tool order received now and then. A list of some size is expected to be placed in the market from

the Pennsylvania railroad shortly, the equipment being needed for plant improvements. Current inquiries being worked on by dealers here include one from the Connersville Blower Co., Connersville, Ind., for a large engine lathe; another from Whitehead & Kales Co., River Rouge, Mich., for a spacing machine, a punch and a large sized angle shear on turn table; one from an unidentified interest for a forging and upsetting machine; and one, from the G. C. Dorn Supply Co., Cincinnati, for a tinners squaring shears. Some dealers also are showing interest in the machinery needs of the National Pressed Gear Co., Canton, O.

Inquiry Improvement Is Noted

CINCINNATI, Oct. 24.—While buying of new tools and machinery still is far below normal there is a stimulating undertone to the market resulting from a gradual improvement in inquiry and more encouraging reports from jobbers and salesmen. The average volume of business is being maintained at the average of the past several weeks with an occasional new purchaser and prospect appearing. No really important sales have been recorded in this market within a fortnight, practically all current orders being for single units. A considerable volume of railroad business is in immediate prospect.

Production Offsets Orders

BOSTON, Oct. 24.—Actual sales of machine tools in this market during the past week show some improvement over the previous week. Machine tool manufacturers report national demand showed an increase early in the month, but the last week has seen incoming orders and rate of production offsetting one another. Railroads which recently have bought heavily in material for repairs as yet have failed to buy machine tools to any extent. The Bangor & Aroostook railroad has a small list out, and several other northern New England railroads are expected to be in the market in the near future.

New Inquiries Continue to Come Out

PITTSBURGH, Oct. 24.—While new projects requiring large equipment installations are few, new inquiries continue to come out from time to time and a few old ones revived. One sheet producer has an inquiry out for four cranes and a foundry interest is receiving prices on three. Another inquiry is out for open hearth equipment. Two or three crane awards are noted this week involving one, two and three cranes each, respectively. Several machine tool lists are pending, including one from the National Tube Co., for 14 machines which involves planers, horizontal boring mill, lathes, milling machines, etc. The Pennsylvania railroad is tabulating bids on eight or 10 machines for Freedom, Pa. The 40 machines for Juniata, Pa., shops will be purchased in Philadelphia. Another machine tool list of eight or 10 items required for the Clairton by-product plant of the Carnegie Steel Co., still is pending. One list of secondhand equipment involves nine tools, including lathes up to 60-inch in size. Used machinery dealers are paying more attention to buying than to selling at the present time, believing that better prices shortly will be obtainable. This premise is based on recently advanced prices of new equipment, practically all lines being 10 to 15 per cent higher. One maker of lathes went up 15 per cent recently, and another make is scheduled for a 10 per cent advance Nov. 1. Many individual inquiries are current involving keyseaters, lathes, milling machines and other items, and recent sales have included a lathe, a band saw and a 36-inch drill to an eastern Pennsylvania user; three grinders to a New York buyer and one broaching machine to a nearby user.

Conditions Are Steadily Improving

MILWAUKEE, Oct. 24.—Despite the spotty character of trade in metalworking machinery, and the limitations of large lot buying, conditions are improving, according to manufacturers and dealers here. Dealers are meeting with a good demand from Wisconsin and northwestern industries, which are pushing themselves back into a comfortable position through steady betterment in orders booked with foundries and machine shops. Manufacturers are getting a part of the business being placed by railroads, the requirements of which in the next 6 to 12 months are expected to be heavy.

Sales and Inquiries Are Fair

LOS ANGELES, Oct. 20.—Industrial operations in this district continue to improve. Most dealers report both inquiries and sales good, the bulk of the sales, however, being

Crane Awards and Inquiries of the Week

Orders Placed

One 5-ton Bedford 3-motor overhead crane with 58-foot span for the Berry Iron & Steel Co., St. Joseph, Mo., to the Miles Machinery Co., Saginaw, Mich.

One each 10-ton and 7½-ton Shaw cranes for the Pittsburgh & Lake Erie railroad, Pittsburgh, to Manning, Maxwell & Moore, Inc., Pittsburgh.

One 10-ton and two 5-ton Shaw cranes for the Jones & Laughlin Steel Co. to Manning, Maxwell & Moore, Inc.

One crane for the Newton Steel Co., Newton Falls, O., to the Alliance Machine Co., Alliance, O.

Two trolleys and some crane equipment for the Follansbee Bros. Co., Follansbee, W. Va., to the Alliance Machine Co., Alliance, O.

One 200-ton electric transfer table to Rock Island railroad, Cedar Rapids, Ia., to the Whiting Corp., Harvey, Ill.

One 8-ton handpower crane for the Pearl Pipe Line Co., Independence, Kan.; one 28-ton handpower crane for the Anderson-Meyer Co., New York; one 10-ton pillar crane for Union Pacific railroad, Omaha; one 10-ton handpower crane for the C. J. Forshner Construction Co., Chicago; one 25-ton handpower crane for the Dells Paper & Pulp Co., Eau Claire, Wis.; three 10 ton handpower cranes for the Michigan Central railroad, Detroit, all awarded to the Whiting Corp., Harvey, Ill.

Two 10-ton cranes, 40-foot boom, equipped with pile driver apparatus, for Japanese Imperial government railway, to Industrial Works.

One 25-ton electric gantry, 10-ton auxiliary, 50-foot span, for installation at Indianapolis, for the Pennsylvania railroad, to Champion Engineering Co.

Three used Orton & Steinbrenner cranes, two of 15-tons capacity and one of 25 tons, for New York Central railroad, to General Equipment Co.

Two 10-ton special electric overhead cranes for installation in a tank house at Perth Amboy, N. J., plant of the Anaconda Copper Mining Co., awarded to an unnamed builder. Either a five or a 10-ton electric crane is still to be purchased.

One 35-ton locomotive crane for Raymond Concrete Pile Co., 90 West street, New York, to McMyler-Interstate Co.

One 20-ton used locomotive crane for Erie railroad, reported placed with M. E. Davis, 50 Church street, New York.

Orders Pending

Cranes for the Clairton by-product coke plant of the Carnegie Steel Co., including one 15-ton and one 5-ton pneumatic crane to be bought by the Koppers Co.; bids being taken.

Two cranes for the Pennsylvania railroad's Conway shop at Freedom, Pa.; bids being taken.

One 10-ton crane for the Universal Steel Co., Bridgeville, Pa.; bids being taken.

Cranes for the Mackintosh-Hemphill Co., including one crane for the A. Garrison Foundry Co.; bids being considered.

Three cranes for a foundry interest in Pittsburgh district; bids being taken.

Four cranes for a sheet mill in Pittsburgh district; bids being taken.

Forty-one cranes for the Gary tube mill of the National Tube Co.; awards expected this week.

One 10-ton crane, Pittsburgh Knife & Forge Co., Coraopolis, Pa.; action expected this week.

One small crane or hoist for the H. J. Heinz Co., Pittsburgh; bids all in.

One 5-ton special gantry crane for Byram Coal Co., Portchester, N. Y.

One 2-yard grab bucket gantry crane, 19-meter span, to be equipped with Shepard cage-controlled hoist, for Frasar & Co., 30 Church street, New York; bids asked.

composed of single tool requirements. Secondhand machinery continues in heavy demand, though some dealers report a tendency on the part of the larger companies to favor new tools. No new inquiries for cranes have been put out during the past two weeks and while several sales are pending no awards have been made.

Among the sales recently made by Eccless & Smith Co. were one lathe, one cutter grinder, one bolt threading machine, one power hack saw and four drill presses. Herberts Machinery & Supply Co. reports the sale of a 60-inch heavy-duty motor driven boring mill to the Santa Fe railroad, a 20-inch heavy-duty shaper to the Pasadena schools, three lathes to the U. S. Tool Co., one lathe and one radial drill to the Burnett Oil Tool Co., Signal Hill, five motor-driven lathes to the General Petroleum Co. and one milling machine to Bishop & Co., Los Angeles.

Burlington Buying Still Delayed

CHICAGO, Oct. 24.—In spite of the expectation that the Burlington railroad would buy shortly against its pending inquiry for machine tools, it has not yet done so. The situation is somewhat irregular, as some dealers find business quieter than during September, while others have been in receipt of sufficient orders to make this month total higher than the preceding. Larger industrial concerns are not now buying and both automobile and agricultural implement makers are out of the market. Manufacturers of printing presses are unusually busy. They have been buyers recently of considerable additional equipment of heavy special types. Prices generally are unchanged, and the movement toward a higher level seems to have been completed. The Rock Island railroad has purchased a crank planer and an electrical equipment manufacturer recently placed an order in Chicago for two horizontal boring machines. Considerable inquiry comes out occasionally for secondhand equipment, which is available now on a better price basis than formerly. Desirable secondhand machines in excellent condition can be obtained at about 65 per cent of the cost of new machines. Prices generally at Chicago are firmer than those in the East, and less tendency to give concessions is noticed.

Improvement in Orders Expected

TORONTO, Ont., Oct. 24.—Business in the machinery and machine tool market is expected to show an improvement this month over that of the previous one. Inquiries continue to come out from sources which have been out of the market for some time as well as from companies with new plants and additions under construction. It appears buying has passed from the replacement buying stage to a demand for equipment on extension and new works account. Railways have been putting off entering the market for some time but it is now apparent that much further delay is out of the question. Car builders are also of the opinion orders for rolling stock will be forthcoming without much delay. Industrial plants are operating very near capacity and as a consequence replacement requirements are becoming greater. The demand for small tools has improved of late. Prices are showing some strength and some dealers are of the opinion that further advances will be forthcoming shortly.

Cannington, Ont., has retained James, Proctor & Redfern, Toronto, Ont., to prepare plans and submit estimates for a waterworks system to include electric equipment and turbine driven pumps. The Carbon Co., York and Glebe streets, London, Ont., will erect a factory for which equipment will be purchased. The Peninsular Cord Tire & Rubber Co., 45 St. John street south, Hamilton, Ont., will build a plant at Hanover, Ont. The Windsor Machine & Tool Co., Windsor, Ont., plans a plant at St. Thomas, Ont.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

HOLT, ALA.—The plant of the Central Foundry Co. recently was damaged by fire.

MOBILE, ALA.—The Mobile Pulley & Machine Works plans to install a steel making plant at its factory.

MONTGOMERY, ALA.—The Standard Electric Works, 17 Bibb street, plans to establish a plant for rebuilding motors, etc.

TARRANT, CITY, ALA.—The National Cast Iron Pipe Co. plans to enlarge and remodel its plant.

BRIDGEPORT, CONN.—The Belknap Mfg. Co. has let the contract for a 2-story, 25 x 60-foot foundry addition.

MERIDEN, CONN.—The Meriden Novelty Co. has been incorporated to make metal goods with $25,000 capital by F. E. Bemis, Hugo A. Zanke and Emil A. Zanke.

NEW BRITAIN, CONN.—The Landers, Frary & Clark Mfg. Co. has let the contract for a 6-story, 80 x 155-foot factory, to cost $70,000.

NEW HAVEN, CONN.—The H. B. Ives Co. has let the contract for a 5-story, 40 x 45-foot and a 1-story 30 x 50-foot factory additions.

NEW BRITAIN, CONN.—The Union Plane Co. has been incorporated to make tools and hardware with $50,000 capital by A. F. Corbin, H. H. Wheeler and C. S. Newman.

NEW HAVEN, CONN.—The H. B. Ives Co., maker of hardware, will erect a 1-story, 30 x 50-foot factory addition.

NEW HAVEN, CONN.—The Crude Oil Detector Co. has been incorporated to make devices with $100,000 capital by A. S. Leichter, Hamden, Conn., Daniel MacDonald and E. M. Augur.

PLANTSVILLE, CONN.—The Blakeslee Forging Co. plans a 2-story foundry addition, 40 x 42 feet.

STAMFORD, CONN.—The Victor Page Motor Corp. will erect a 1-story, 50 x 52-foot factory.

WILMINGTON, DEL.—The Treler Co. of America has taken over the plants of the Artillery Fuse Co. and is installing equipment for the manufacture of automobile parts.

JACKSONVILLE, FLA.—The P. H. Palmer Co. has been incorporated by P. H. Palmer, Charles Atkins and others.

MIAMI, FLA.—The Miami Electric Light Co. plans a 1-story pump house, 17 x 62 feet to cost $20,000.

QUITMAN, GA.—An addition will be made to the foundry and machine shops of the Southern Machinery Co. which will double the present capacity.

ROME, GA.—The McLin Textile Mills plans a large plant here.

BELLEVILLE, ILL.—The plant of the Illi-

nois Foundry & Machine Co. recently was damaged by fire.

CHICAGO—The Columbia Metal Products Co., 357-61 East Ohio street, has been incorporated with $50,000 capital stock by Julius Morris, M. J. O'Neill and Emile Levy.

CHICAGO—The Commercial Auto Body Co. has changed its name to the Wever Body Co. and increased its capital stock from $40,000 to $200,000.

CHICAGO.—The machine shop of the Lehon Roofing Co., Forty-fourth street and South Oakley avenue, recently was damaged by fire.

CHICAGO.—The Bassick Mfg. Co., 2638 North Crawford avenue, plans a 1-story factory building, 55 x 142 feet to cost about $30,000.

CHICAGO.—The Chicago Machine Products Co., maker of automobile locking devices, has leased a 1-story building now being erected, at 4711-15 West Lake street.

CHICAGO—The Imperial Safety Device Corp., 735 West Sixty-fifth street, has been incorporated with $10,000 capital stock by A. A. Schwartzbach, David Lipman and Richard R. Klein.

CHICAGO.—The Western Engineering & Mfg. Co., 360 East Grand avenue, has been incorporated with $50,000 capital stock by J. E. Cornell, A. M. Bates, C. B. Cole and C. K. Cole.

CHICAGO—The Imperial Safety Tube & Tank Co., 735 West Sixty-fifth street, has been incorporated with $25,000 capital stock by A. A. Schwartzbach, David Lipman and Richard R. Klein.

CHICAGO—The Chicago Machine Products Co., 12 South Jefferson street, has been incorporated by Vance P. Wilkins, A. H. Brealove and others. The company is represented by Tenney, Harding & Sherman, 137 South La Salle street.

CHICAGO.—Protect Your Home Lock Co., 309 South LaSalle street, has been incorporated with $50,000 capital to deal in merchandise, operate a foundry, etc., by Joseph C. Wolon, E. M. Wolon, Max B. Ginsberg, Charles McCabe and others.

CHICAGO—The Swan Metallic Seal & Cap Co., 208 South La Salle street, has been incorporated with $30,000 capital stock by Hiram De Camp, Lloyd J. Smith, and Simon C. Witmer. The company is represented by Simon C. Witmer, Continental & Commercial Bank building.

GRANITE CITY, ILL.—The Howe Safety Appliance Co. has increased its capital stock from $250,000 to $750,000.

MORRIS, ILL.—Rudlow Bros. plan a welding shop, one story, 60 x 84 feet, to cost about $20,000.

BUFFALO—The Burghart Labeling Machine Co. has been incorporated with $50,000 capital stock by L. F. Burghart, L. W. Wipperman and A. R. Kochler. The company is represented by Coatsworth & Diebold, attorneys.

COLLEGE POINT, L. I., N. Y.—The Unit Ventilation Co. plans a 1-story factory building, 51 x 100 feet, to cost about $28,000.

ELMIRA HEIGHTS, N. Y.—The Elmira Metal Crafts Corp. has been incorporated with $10,000 capital stock by F. H. Lindberger, R. B. Hazlett and C. Bullard. The company is represented by E. Buhr, attorney.

JAMESTOWN, N. Y.—The Watson Mfg. Co., 63 Taylor street, plans a 4-story addition to cost about $30,000.

JAMESTOWN, N. Y.—Henry Bros., 610 West Seventh street, maker of truck bodies, etc., plans a 1-story plant addition.

JOHNSON CITY, N. Y.—The Binghamton Light, Heating & Power Co. plans a power house addition, two stories, 30 x 60 feet, to cost about $70,000.

NEW YORK—The Speed-O-Multiple Valve Lifter Corp. has increased its capital stock from $15,000 to $100,000.

NEW YORK—Work will be started shortly on a repair shop addition for the Transit commission.

NEW YORK—The Ingersoll-Rand Co., 11 Broadway, plans to increase its capital stock and make some plant improvements.

NEW YORK—The American Smelting & Refining Co., 120 Broadway, plans extensions and improvements to its properties in Colorado.

NEW YORK.—The J. A. Sexauer Mfg. Co., 523 Eighth avenue, maker of pipe fittings, etc., plans a 2-story factory building, 25 x 100 feet.

NEW YORK—A large generating plant will be erected on Staten Island by the city to supply power for a proposed trackless trolley system.

NEW YORK—The Brass Foundry Corp. has been incorporated with $15,000 capital stock by L. Stein, J. Schlachter and J. Safer. The company is represented by W. Karlin, 162 Nassau street.

NEW YORK—The Harold Machinery Co. has been incorporated with $5000 capital stock by D. and R. Paradis and L. Grumer. The company is represented by M. D. Siegel, attorney, World building.

SYRACUSE, N. Y.—The Pierce, Butler &

Business Changes

FREDERICK D. Dimmick, 501 Franklin Bank building, Philadelphia, has succeeded the Debevoise Anderson Co., as New York pig iron sale representative of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

* * *

The Krantz works, Brooklyn, N. Y., of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been transferred to Mansfield, O.

* * *

J. K. Larkin & Co., Inc., has been incorporated to succeed J. K. Larkin & Co., 253 Broadway, New York, iron and steel products.

* * *

The Atwill-Makemson Coke & Coal Co., McCormick building, Chicago, has succeeded David Evans & Co., Chicago, as by-product coke sales agent for the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

Metalworking Tool Exports Decline

EXPORTS of metalworking machinery during July were considerably below those for June, according to figures just issued by the United States department of commerce, bureau of foreign and domestic commerce. Total exports for July were 192 *tools valued at* $150,980 *which compares with* 421 *machines valued at* $256,680 *in June. The figures show that in July 76 lathes valued at* $61,443 *were exported which compares with* 64 *valued at* $84,198 *in the preceding month; 65 boring and drilling machines valued at* $28,059 *which compares with* 273 *valued at* $68,580 *in June; 26 planers, shapers and slotters valued at* $33,081 *against* 45 *valued at* $52,280 *in the preceding month, and 25 milling machines valued at* $27,597 *which compares with 39 valued at* $51,622. *The following shows where the tools were distributed during July:*

Countries	Lathes No.	Lathes Dollars	Boring and drilling machines No.	Boring and drilling machines Dollars	Planers shapers and slotters No.	Planers shapers and slotters Dollars	Milling machines No.	Milling machines Dollars
Belgium	4	4,105	..	.....	2	3,092	..	.....
France	11	7,105	4	2,090	33	7,374	5	7,580
Latvia	..	.....	..	.....	1	240	2	88
Netherlands	1	765	..	.....	..	.....	..	.....
Russia in Europe	1	400	1	500	..	.....	..	.....
Sweden	..	.....	..	.....	..	.....	1	200
England	3	4,281	5	3,291	1	460	9	12,564
Scotland	..	.....	1	860	..	.....	..	.....
Ireland	..	.....	..	.....	1	1,765	..	.....
Canada—								
Ontario & Quebec	16	6,706	32	3,681	2	533	2	3,000
British Columbia and Yukon	2	1,406	4	890	1	1,044	..	.....
Prairie Provinces	1	680	2	124	..	.....	..	.....
Honduras	..	.....	2	135	..	.....	..	.....
Nicaragua	1	519	..	.....	..	.....	..	.....
Mexico	26	23,303	3	1,822	5	5,750	..	.....
Cuba	..	.....	..	.....	..	.....	1	144
Brazil	1	1,221	..	.....	2	1,100	..	.....
Ecuador	..	.....	..	.....	1	940	..	.....
Chile	..	.....	4	14,180	4	8,680	..	.....
Peru	1	4,629	..	.....	..	.....	..	.....
Venezuela	1	3,359	1	67	..	.....	..	.....
British India	..	.....	3	419	..	.....	1	216
Japan	2	1,363	..	.....	2	2,175	4	3,805
New Zealand	4	1,444	..	.....	..	.....	..	.....
British South Africa	11	157	..	.....	1	728	..	.....
Total	76	61,443	65	28,059	26	33,881	25	27,597

Pierce Mfg. Corp. plans extensions and improvements.

DUNN, N. C.—Goodwin & Williams, electrical switches, have been incorporated with $1,000,000 capital stock by Thomas L. Vaughn and others.

CANTON, O.—Contract has been let for the first unit of the proposed plant of the National Pressed Gear Co.

CINCINNATI—The Monroe Brass & Wire Co. has been incorporated with $5000 capital stock by G. F. Monroe, Oliver S. Bryant and G. Jolly.

CLEVELAND.—The Lees-Bradner Co. is considering a plant building.

DAYTON, O.—The Lowe Bros. Co. plans a factory addition.

FREMONT, O.—The capacity of the local plant of the National Carbon Co. will be enlarged.

KENT, O.—The Lamson & Sessions Co. plans an addition to its plant here.

LORAIN, O.—Work has been started on an addition to the Edgewater power plant of the Ohio Public Service Co. It will be three stories, 60 x 280 feet.

MT. VERNON, O.—The Hope Forge & Machine Co. is erecting a plant building, 60 x 110 feet, and a storage building, 48 x 125 feet.

PORT CLINTON, O.—The American Gypsum Co. is drawing plans for a factory and office building.

BETHLEHEM, PA.—A $250,000 factory will be erected by the Confederate Home Abattoirs Co., which recently was incorporated.

JACOBS CREEK, PA.—The U. S. A. Drug & Chemical Co. plans a factory building to cost about $150,000.

KINZUA, Pa.—The Kinzua Light & Power Co. plan a power plant.

LANCASTER, PA.—The Andes Mfg. Co. plans a 1-story factory building.

NEW CASTLE, PA.—The Fowler Radiator & Mfg. Co. has plans for a 1-story plant addition.

PHILADELPHIA—Bids will be closed on a plant for Fred J. Schaefer. M. H. Dickinson is architect in charge.

PHILADELPHIA—A 1-story plant addition will be erected by the Precision Grinding Wheel Co., Inc.

PHILADELPHIA—The general contract for a foundry building for the Adelphia Mfg. & Plating Co. has been awarded to Harry Brocklehurst.

PHILADELPHIA—Work will be started shortly on a 5-story factory building for George B. Clapp. The Ballinger Co. is architect in charge and the Barclay White Co., general contractor.

PITTSBURGH—The Neely Nut & Bolt Co. plans a 1-story plant addition.

PITTSBURGH—Hubbard & Co., Granite building, manufacturers of shovels, etc., plan a 1-story plant addition.

PITTSBURGH—The Equitable Gas Co., 435 Sixth avenue, plans a 1-story machine and repair shop, 50 x 165 feet, with an extension, 15 x 20 feet.

SCRANTON, PA.—The Scranton Wire Works, 723 Lackawanna avenue, plans to establish a department for the manufacture of metal grille work.

YOUNGWOOD, PA.—The Robertshaw Mfg. Co., manufacturer of pipe fittings, etc., plans a machine shop and foundry each one story, 110 x 130 feet and 30 x 65 feet, respectively.

PAWTUCKET, R. I.—The Phillips Wire Co. plans a 1-story, 40 x 60-foot power house addition.

FAIRFAX, S. C.—F. M. Young plans to rebuild his power house which was recently damaged by fire with a loss estimated at $25,000.

SPARTANBURG, S. C.—The Fresh Water Pump Co. has been incorporated with $20,000 capital stock by W. D. Burnett and L. S. Burnett.

CHATTANOOGA, TENN.—The Rabe Pipe & Foundry Co. plans a plant addition 100 x 150 feet.

BRATTLEBORO, VT.—Contract has been awarded for a steel cutting shed, machine shop and office for the Presbrey Leland Granite Co.

RUTLAND, VT.—The plant of the Manning Mfg. Co., manufacturer of dairy machinery, recently was damaged by fire.

LA CROSSE, VA.—The La Crosse Light & Power Co. has been incorporated with $5000 capital stock by O. F. Northington, E. D. Nash and others.

FAIRMONT, W. VA.—The Consolidation Coal Co. plans a 1-story power house to cost $90,000.

HUNTINGTON, W. VA.—The Armstrong Mfg. Co., electrical specialties, has let the contract for a plant addition.

AMHERST, WIS.—A. G. Kernin, Earl Bochman and Charles H. Simpson have incorporated

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.065c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	2.95c to 3.10c
Cleveland	2.91c
Detroit	3.00c
New York	3.04c
Philadelphia	3.025c
San Francisco	3.40c
Seattle	3.60c
St. Louis	2.90c
St. Paul	3.05c
Los Angeles	3.50c

IRON BARS

Boston	3.065c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	3.10c
Detroit	3.00c
New York	3.04c
Philadelphia	3.025c
St. Louis	2.90c

SHAPES, STRUCTURAL

Boston	3.165c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	3.05c to 3.20c
Cleveland	3.01c
Detroit	3.10c
New York	3.14c
Philadelphia	3.125c
San Francisco	3.40c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.60c

PLATES

Boston	3.165c
Boston 3/16-inch	3.04c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	2.95c to 3.20c
Cleveland	3.01c
Detroit	3.10c
New York	3.14c
Philadelphia	3.125c
San Francisco	3.50c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.65c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.15c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	3.75c to 4.00c
Cleveland	3.70c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.00c
Cleveland	4.40c
Detroit	4.90c
New York	4.90c
Philadelphia	4.60c
San Francisco	6.05c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c

NO. 28 GALVANIZED SHEETS

Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.20c
Cleveland	5.40c
Detroit	5.90c
New York	5.90c
Philadelphia	5.75c
San Francisco	6.90c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c

BANDS

Boston	4.25c
Buffalo	3.90c
Chicago	3.55c
Cincinnati	3.70c to 3.85c
Cleveland	3.71c
Detroit	3.80c
New York	3.84c
Philadelphia	3.825c
San Francisco	4.05c
Seattle	4.35c
Los Angeles	4.40c

HOOPS

Boston	4.75c
Buffalo	4.10c
Cleveland	3.71c
Detroit	4.20c
New York	4.39c
Philadelphia	4.25c
Seattle	5.00c

COLD ROLLED SHAFTING

Boston (rounds)	4.00c
Boston (shapes)	4.50c
Buffalo	3.95c
Chicago (rounds)	3.80c
Chicago (shapes)	4.30c
Cincinnati (rounds)	3.75c
Cleveland (rounds)	3.75c
Cleveland (shapes)	4.25c
Detroit (rounds)	3.80c
Detroit (shapes)	4.30c
New York	3.90c
New York (shapes)	4.40c
Philadelphia (rounds)	3.85c
San Francisco	5.00c
Seattle	5.25c
Los Angeles	5.10c

The Cincinnati Times-Star is an excellent newspaper, of wide circulation, publishing Associated Press dispatches and other news reports, business and industrial information of a reliable character.

These four commanding developments during the past year have combined to build a solid foundation for business resumption and to lift the general economic situation to a new level of promise for 1922, the Iron Trade Review says in its annual industrial digest of the iron and steel business. Present indications are for increasing production, dwindling unemployment and fairly satisfactory competitive trade conditions during the year, the review

400 Newspapers Regularly Quote

IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of the IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

the Amherst Electric Co. with $50,000 capital stock to build, maintain and operate hydro-electric plants. A power site on the Wisconsin river near Mosinee will be developed at once.

JANESVILLE, WIS.—The Janesville Refrigerator & Pump Co. has been incorporated with a capital stock of $10,000 by S. V. Corona, M. E. Douglas and Dan. H. Peterson to manufacture refrigerating units, pumps, etc.

KOHLER, WIS.—Paul Riesen's Sons, 1018 Humboldt avenue, Milwaukee, have the general contract for erecting a 4-story enamel grinding mill building, 75 x 165 feet, for the Kohler Co. It will cost about $125,000.

MILTON, WIS.—The Burdick Cabinet Co. has let the contract for a 2-story factory addition, 80 x 160 feet, to S. N. Lowther, Milton.

MILWAUKEE.—The Coddington Engineering Co., 290 Third street, has the contract to build a garage and service building 75 x 150 feet, for the Grand Avenue Buick Co.

MILWAUKEE—The Terner Metal Specialty Co. has been incorporated with $10,000 capital stock by Edward H. Meldman, 1324 Galena street, Robert A. Hess and M. J. Morse.

MILWAUKEE—J. H. Fowles, secretary of the Public Sewerage commission, closed bids Oct. 20 for the construction of 1300 lineal feet of 30-inch cast iron pipe siphon, with riser and drop shaft, blow-off manhole, etc.

MILWAUKEE—The Newton Engineering Co., 185 Mason street, has taken the general contract to build a 3-story garage and repair-shop, 50 x 150 feet, for the Magnetic Realty Co. at Eighth and Sycamore streets, Milwaukee.

MILWAUKEE—Articles of incorporation have been filed by the Lerner Metal Specialty Co., capital stock $10,000. It will manufacture metal specialties, as indicated by the name. The incorporators are Edward Meldman, M. Morse and Robert A. Hess, attorney, 114 Grand avenue.

NORTH MILWAUKEE, WIS.—An architect will be selected Oct. 31 by the school board to plan the proposed new North Milwaukee high school at Thirty-sixth street and Hammond avenue, for which purpose about $200,000 has been set aside. It will contain industrial education departments.

RICE LAKE, WIS.—The Brunet Heating System, Inc., John L. Dahl, president, expects to start work at once on its permanent plant, to consist largely of a sheet metal works for manufacturing hot air heating devices. The first unit, with equipment, will cost about $75,000.

Throughout the West

NEWPORT, ARK.—The Merryman Stave Bolt Co. has been organized by R. W. Merryman, Cardwell, Mo. and others.

LOS ANGELES.—The Bedell Engineering Co. has awarded a contract for a 1-story plant building, 92 x 130 feet to cost about $25,000.

LOS ANGELES.—The Kroyer Mfg. Co. plans a 5-story factory building at Long Beach, Cal.

OAKLAND, CAL.—The Western Stove Co. plans a plant at Pomona, Cal.

SAN FRANCISCO—Louis Skerl, 298 Eleventh street, plans a 2-story factory building to be devoted to metalworking.

DENVER, COLO.—The Stoll Mfg. Co. plans to rebuild its plant which recently was damaged by fire.

DULUTH, MINN.—The Hanna Ore Mining Co., Fidelity building, plans a 2-story machine shop, 80 x 106 feet to cost $115,000.

ST. PAUL—The American Radiator Co., Buffalo, is considering the erection of a plant here.

KANSAS CITY, MO.—The Hillman-Ayres Mfg. Co., machine tools, has been incorporated by W. B. Laughlin, J. P. and A. A. Hillman.

KANSAS CITY, MO.—The Missouri Pacific railroad plans a 1-story steel car repair shop here, 120 x 510 feet.

TRENTON, MO.—A. J. Slonecker plans to establish a plant here for the manufacture of jack screws, etc.

COLUMBUS, TEX.—The Gimmer-Tanner Gravel Co. plans to rebuild its machine and forge shop recently damaged by fire.

CUERO, TEX.—The Cuero Light & Power Co. plans extensions and improvements to its plant and system.

MT. VERNON, WASH.—The Mount Vernon Machine Works has been incorporated with $10,000 capital stock by D. Hammack, E. O. Ellington, W. H. Utter and Willard E. Geary.

Business in Canada

BELLEVILLE, ONT.—The A. W. Robertson Co. has purchased the interests of the Quinlan Robertson Co., Montreal, Que., consisting of several hundred acres of gravel. A railway siding is being constructed and workmen's houses will be erected. A dam also will be constructed and electric power developed. Considerable gravel handling equipment will be installed.

PETROLEA, ONT.—President Schoen of the Peninsular Sugar Co. reports that progress is being made here in connection with the erec-

(Concluded on Page 1158)

New Trade Publications

PULLEYS—McMahon & Co., Worcester, Mass., is circulating an illustrated folder in which patent friction pulleys, friction cut-off couplings and friction clutches are described and illustrated.

PANEL BOARDS—A folder has been published by the Sprague Electric Works of the General Electric Co., New York, in which safety type panel boards and cabinets are described and illustrated. These are designed for places where the bus-bars and other live parts must be covered, yet the fuse plugs be left accessible.

MOTORS—Four booklets have been published by the Century Electric Co., St. Louis, in which as many types of motors are described and illustrated. One bulletin is devoted to repulsion start induction single phase motors; a second to automatic start induction polyphase motors; a third to split phase induction motors and the fourth to squirrel cage induction polyphase motors.

TRUCK TRAILERS—A 32-page illustrated booklet issued jointly by the General Motors Truck Co., Pontiac, Mich., and the Detroit Trailer Co., Detroit, presents complete tractor and trailer information. This, it is claimed, is the first time data covering both units necessary for modern highway transportation are brought together in convenient form. Both the tractor and trailer are described and illustrated in detail and in addition numerous illustrations show both units in operation. A chart in the booklet, showing five systems of modern highway transportation, is interesting.

LOCOMOTIVE REPAIRS—The Metal & Thermit Corp., New York, has published the fourth edition of its locomotive repair pamphlet, which should be of especial interest to superintendents of motive power, general foremen, blacksmith foremen and welders. The pamphlet contains many revisions of data given in a former issue, chief among which are instructions for applying important improvements in welding practice. The drawings and instructions illustrating and describing metal welds in various parts of locomotive frames and other locomotive and railroad equipment have been completely revised.

FLOORS—The Marine Decking & Supply Co., Philadelphia, has published a 24-page illustrated booklet in which modern flooring methods are described and illustrated. The booklet chiefly is devoted to describing flooring material manufactured by the company. This material is said to have given exceptionally satisfactory service upon the decks of ships and in industrial plants. The principal ingredient is calcined magnesite, which is mixed dry with certain fillers to give the finished floor a hardness commensurate with elasticity. To this is added a magnesium chloride solution which brings it to a plastic state in which it is applied to the floor or foundation. The composition hardens over night, presenting a smooth, level surface, unbroken by seams. It is noninflammable.

ENGINEERING SERVICE—Federated Engineers Development Corp., Jersey City, N. J., has published a 32-page illustrated booklet in which in addition to pointing out the engineering service which it furnishes, describes and illustrates a number of new machines and other appliances which it has developed or helped to develop. The service of this organization is restricted entirely to designing, building and installing automatic or semiautomatic machines or special equipment for the large production of duplicate parts or articles. In addition to its department of engineering the organization operates a department of inventions.

GENERAL CATALOG—The Link-Belt Co., Chicago, has published a new general catalog which embraces its entire line, and is the most complete one the company has ever issued. It contains 832 pages, is cloth bound and not only includes the Link-Belt line but also the products of the H. W. Caldwell & Son Co., a subsidiary company. The contents include a description of chains and wheels, power transmission machinery, elevator boots, buckets, castings; conveyor equipment; boiler plant equipment; coal tipple equipment; locomotive coaling stations; car loaders and unloaders; locomotive and crawler type cranes; electric hoists; sand and gravel washing equipment, etc.

STRONGER THAN CASTINGS

Motor Support
Formerly a Casting

Any number of tests will prove that Parish and Bingham Pressed Steel Parts are far stronger than castings. Also, that they are far tougher than castings; also far less brittle, far lighter in weight, far more uniform in weight, far more uniform in shape, and finally, FAR CHEAPER. Furthermore, when you get them, they are completely finished—there is no machining whatever to do.

If you have nothing with which we can help you at present, get in touch with us when you have occasion to design new parts.

Parish & Bingham Engineers are specialists in designing suitable pressed steel substitutions for castings. MAY THEY HELP YOU?

Parish & Bingham Corporation

Builders of Automobile Frames and Steel Stampings

CLEVELAND, OHIO

PARISH & BINGHAM
Pressed Steel Parts

Business in Canada

(Concluded from Page 1156)

tion of a large sugar refinery. The contract for 75 tons of steel for the warehouse has been let to the Sarnia Bridge Co.

STREETSVILLE, ONT.—The Streetsville Lumber Co., Ltd., incorporated in August, plans plant extensions and the installation of new equipment.

SAULT STE. MARIE, ONT.—The Kirstin-Hase Co., Ltd., has been incorporated to take over the business of the A. J. Kirstin Canadian Co. and manufacture agricultural implements with $175,000 capital stock by Alfred J. Kirstin, Escanaba, Mich., Robert Hase, this city, and Nelson E. D. Lafferty.

TORONTO, ONT.—Fire which broke out in the planing mill of the James P. Gilbert Lumber Co., 496 Gladstone avenue, caused damage to building and equipment estimated at $20,000. It is the intention of the company to rebuild immediately.

MONTREAL, QUE.—The Atlas Brick Co., which operates under the direction of the Interprovincial Brick Co. of Canada, Ltd., plans to purchase and install equipment.

MONTREAL, QUE.—In connection with the reorganization of the Riordon Pulp & Paper Co. it is stated plans are being considered for the completion of the Kipawa mill.

MONTREAL, QUE.—The International Combustion Co., Ltd., has been incorporated to manufacture furnaces, etc., with $50,000 capital stock by Frank B. Common, Francis G. Bush and Herbert W. Jackson.

MONTREAL, QUE.—The Tweedale Co., Ltd., has been incorporated to manufacture wireless apparatus, etc., with $20,000 capital stock by Daniel McAvoy, Pierre Arbour and Joseph Landry.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Mesabi Bessemer, 55 per cent iron	5.70
Old Range nonbessemer, 51½ per cent iron	5.20
Mesabi nonbessemer, 51½ per cent iron	5.05

PORT HENRY IRON ORE
Per Gross Ton, F.o.b., Port Henry

Old bed 21 furnace	$5.00
Old bed concentrates, 63 per cent	5.25
Harmony, cobbed, 63 per cent	5.25
New bed, low phos., 65 per cent	7.50
Lump ore for fix	6.00

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports.

Spanish low phosphorus, 52 to 54 per cent	9.50 to 10.50
Algerian low phosphorus, 52 to 54 per cent	10.50 to 11.30
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 68 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 54 per cent	8.50 to 9.50

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 29½ cents per unit.

Indian 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Caucasian, 52 per cent, c.i.f. Atlantic ports, 29 cents per unit.

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton	$21.50

Rivets

Structural rivets, Pittsburgh	3.00c to 3.25c
Boiler rivets, Pittsburgh	3.10c to 3.35c
Rivets, ⅞-inch and smaller	65 off to 65-5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts ⅞-inch and smaller	70-10-5 off
Case hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
⅜ x 6 inches, smaller and shorter

Rolled thread	50-10-5 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60-5 off
Cut thread	50-10 off
Larger and longer	50-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	45 off
Larger and longer	45 off
Lag screws	50-10 to 60-5 off
Plow bolts Nos. 1, 2 and 3 heads	50-5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	45 off

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
Butt Weld		
⅛-inch	49	23½
¼ and ⅜-inch	55	29½
½-inch	60	46½
¾-inch	64	52½
1 to 3-inch	66	54½
Lap Weld		
2-inch	59	47½
2½ to 6-inch	63	51½
7 to 8-inch	60	47½
9 to 12-inch	59	46½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	64	52½
Lap Weld		
2-inch	57	45½
2½ to 6-inch	61	49½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	45	28½
¼ and ⅜-inch	51	34½
½-inch	57	46½
¾-inch	62	51½
1 to 1½-inch	64	53½
2 to 3-inch	65	54½
Lap Weld		
2-inch	57	46½
2½ to 4-inch	61	50½
4½ to 6-inch	60	49½
7 to 8-inch	56	43½
9 to 12-inch	50	37½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	46	36½
¾ to 1½-inch	49	39½
2 to 2½-inch	51	41½
Lap Weld		
2-inch	45	36½
2½ to 4-inch	47	38½
4½ to 6-inch	46	37½
7 to 8-inch	42	29½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+ 7	+33
½-inch	26	8
¾-inch	32	17
1 to 1½-inch	34	19
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	29	15
2½ to 6-inch	32	19
7 to 12-inch	30	17
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+15	+48
½-inch	25	13
¾-inch	32	18
1 to 1½-inch	34	20
Lap Weld		
2-inch	30	17
2½ to 4-inch	33	21
4½ to 6-inch	32	20
7 to 8-inch	25	13
9 to 12-inch	20	8

DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+37½	+49½
¾-inch	+18	+30
1-inch	+34	+46
1¼-inch	+18	+30
1½-inch	+17	+29
Lap Weld		
2 and 2½-inch	+ 3	+15
3 to 4-inch	2	+ 7
4½ to 6-inch	1	+ 7
8-inch	+ 4	+ 8

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL	
1¼-inch	17½
2 and 2¼-inch	32
2½ to 3-inch	43
3¼ to 4-inch	48
CHARCOAL IRON	
1½-inch	+11
1¾-inch	+ 1
2 and 2¼-inch	9
2½ to 3-inch	14
3¼ to 4½-inch	16
SEAMLESS COLD DRAWN	
1-inch	51
1¼ and 1½-inch	43
1¾-inch	27
2 and 2¼-inch	30
2½ and 2¾-inch	34
3-inch	38
3¼ to 4-inch	43
4½ and 5-inch	35
SEAMLESS HOT ROLLED	
3-inch	40
3¼ to 4-inch	45

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	85 off
Carbon, 0.30 to 0.40 per cent	83 off
Carbon, 0.40 to 0.50 per cent	82 off

Plus usual differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	19c
3-inch	7-gage	34c
1½-inch	9-gage	13¼c
5⅛-inch	9-gage	53c
5½-inch	9-gage	55c

Plus usual extras for forming and for long lengths.

CAN THERE BE A BETTER METHOD OF LOADING?

IS it possible to load material mechanically on a principle superior to that built into the Link-Belt power-swiveling loader?

All of our experience—all of our engineering ability—all of our manufacturing skill—has been called upon to make this machine the "last word" in loader construction.

You must see this Link-Belt Loader at work to appreciate it. Briefly, here is how it operates—

Simply backs into the pile under its own power, cuts a complete semi-circle, digging and loading all the time. When the semi-circle is complete, it backs into the pile a little further, cuts another semi-circle (loading as fast as you can take care of the material) and repeats this operation until the job is done.

Simple, easy, effective—no "frills" or "attachments" to assist it—the principle is correct. It is built right—it works right. The entire Link-Belt organization stands behind it.

To be convinced, let us show you one of the Link-Belt Power Swiveling Loaders in operation.

LINK-BELT COMPANY

950

PHILADELPHIA

New York	Woolworth Bldg.
Boston 9	49 Federal St.
Pittsburgh	1501 Park Bldg.
St. Louis	Central National Bank Bldg.
Buffalo	347 Ellicott Square
Wilkes-Barre	2nd National Bank Bldg.
Huntington, W. Va.	Robson-Prichard Bldg.

CHICAGO

Cleveland	429 Kirby Bldg.
Detroit	4710 Woodward Ave.
Kansas City, Mo.	806 Elmhurst Bldg.
Seattle	820 First Ave., S.
Portland, Ore.	101 First St.
San Francisco	180 Second St.
Los Angeles	163 N. Los Angeles St.
H. W. CALDWELL & SON CO.,	CHICAGO, 17th and Western Aves.,
NEW YORK, Woolworth Bldg.	

INDIANAPOLIS

Denver	Lindroth, Shubart & Co., Boston Bldg.
Louisville, Ky.	Frederick Webb, Starks Bldg.
New Orleans	C. O. Hinz, 804 Carondelet Bldg.
New Orleans	Whitney Supply Co. Ltd. 419 S. Peters St.
Birmingham, Ala.	S. L. Morrow, 730 Brown-Marx Bldg.
In Canada,	Canadian Link-Belt Co., Ltd., Toronto & Montreal
DALLAS, TEXAS, 709 Main St.	

LINK-BELT

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	667,300	281,700	92,700	58,000
Monthly average 1921..	217,600	280,300	71,800	79,600
1921				
January	642,100	288,000	110,600	93,500
February	463,600	287,400	103,700	81,700
March	386,000	295,300	104,700	27,600
April	60,300	287,700	94,700	70,800
May	13,600	278,100	74,600	78,700
June	800	289,900	67,400	81,700
July	10,200	202,400	44,600	70,000
August	94,200	250,800	43,800	72,800
September	158,300	239,800	59,800	86,200
October	235,500	251,800	45,800	98,800
November	271,800	290,000	59,800	92,400
December	275,000	296,300	73,000	100,800
Total for 1921.....	2,611,400	3,308,500	862,500	955,000
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	.....	.....	.....

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	754,700	250,200	101,300	49,000
Monthly average 1921..	302,100	254,500	65,000	62,300
1921				
January	493,400	263,700	119,100	70,800
February	483,500	259,600	98,400	62,000
March	359,100	246,900	96,300	19,700
April	70,600	252,600	108,700	57,100
May	3,700	240,400	62,800	56,100
June	2,700	240,800	54,200	61,000
July	117,200	219,500	26,900	57,100
August	434,100	228,600	27,800	55,100
September	429,300	232,100	34,000	76,200
October	405,400	255,900	41,900	81,800
November	443,800	272,700	46,200	69,900
December	381,000	297,600	63,200	80,700
Total for 1921.....	3,625,800	3,010,400	779,500	747,500
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	.....	.....	.....

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
Average monthly 1921..	137,100	38,500	43,300	.....
1921				
January	157,800	44,200		
February	153,400	35,400	120,100	125,000*
March	156,100	33,900		
April	102,100	26,100		
May	81,900	31,700	95,500	36,000
June	84,500	20,700		42,100
July	103,600	30,300		45,100
August	141,500	16,100	130,600	61,200
September	206,100	27,900		79,800
October	172,800	19,800		96,600
November	169,200	20,700	168,000	54,300
December	117,000	128,000		56,300
Total for 1921.....	1,646,000	434,800	514,200	596,400*
1922				
January	88,700	36,600	139,000	68,200
February	64,600	55,800	First	66,900
March	63,800	67,300	Quarter	105,700
April	59,900	89,100	.....	129,000
May	60,900	41,100	.....	154,300
June	52,800	73,200	.....	136,690
July	55,900	54,800	.....	182,900
August	80,100	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	516,900
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	271,100	74,600	74,300	143,600
1921				
January	232,400	89,300		
February	166,900	125,800	294,000	503,600*
March	148,900	122,700		
April	160,100	117,400		.....
May	99,000	96,900	241,300	127,800
June	64,700	109,100		159,700
July	64,000	87,600		175,000
August	76,500	122,500	192,300	236,300
September	133,300	171,200		221,800
October	155,800	188,300		242,300
November	193,500	167,400	176,000	230,600
December	205,300	131,700		212,900
Total for 1921.....	1,700,400	1,529,900	903,600	2,110,000*
1922				
January	253,300	164,000	198,400	218,200
February	223,400	107,000	First	170,000
March	295,800	72,300	Quarter	208,700
April	258,400	125,800	.....	195,500
May	272,400	122,200	.....	204,500
June	236,300	180,300	.....	209,132
July	251,700	182,100	.....	206,200
August	270,000	.....	.....	.....

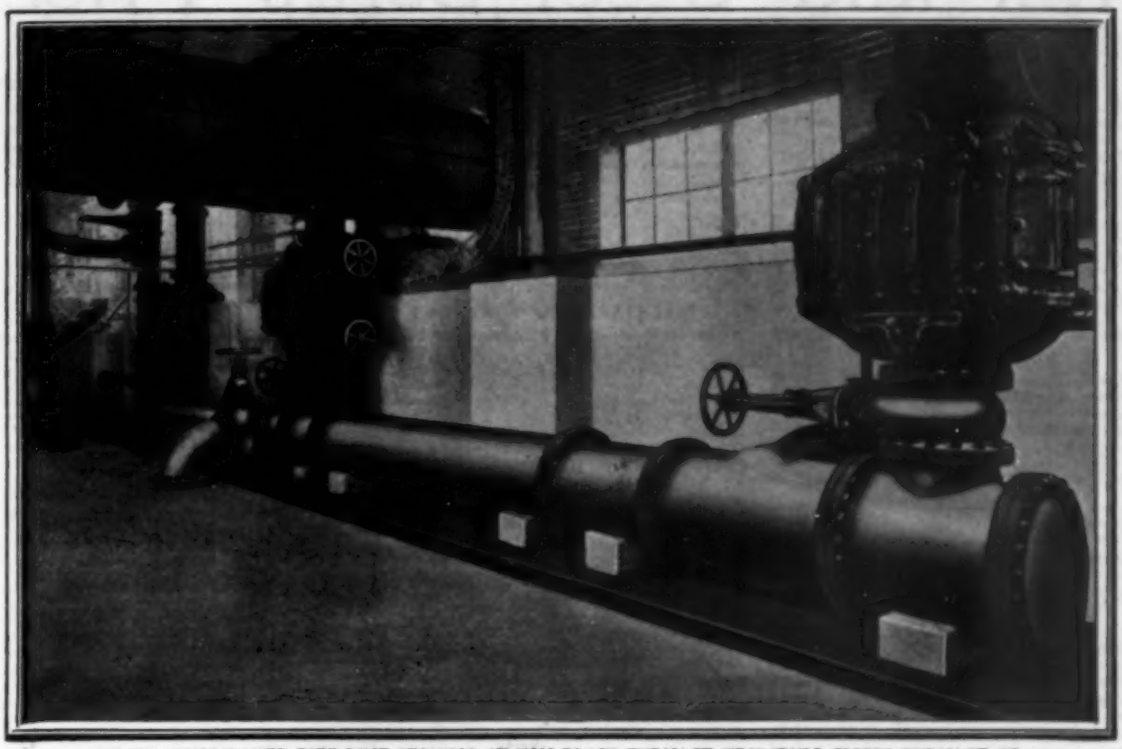
*Provisional estimate. Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1922		
August	32,010	144,264
July	44,384	156,392
June	24,101	216,298
May	17,292	229,616
April	15,884	197,562
March	8,612	206,474
February	10,216	133,333
January	10,511	155,822
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818

1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
December	39,806	254,780
November	43,826	336,994
October	40,698	302,459
September	43,567	363,531
August	28,987	396,743
July	28,258	287,685
June	21,056	561,020
May	17,885	422,282
April	16,560	396,813
March	17,632	367,224
February	12,302	344,180
January	16,913	371,570
Total	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687



CIRCULATING WATER PIPE LINE SERVING 600-TON BLAST FURNACE, TRUMBULL-CLIFFS FURNACE CO.

SAFE WATER CIRCULATING SYSTEMS

An unfailing supply of circulating water is of such great importance in furnace operation as to receive first consideration in laying out a plant. To provide for uninterrupted service, equipment of proved reliability is specified for the construction. The circulating water system of the new 600-ton blast furnace of the Trumbull-Cliffs Furnace Company provides several independent sources to guarantee a constant water supply. Crane valves, fittings and piping are used throughout to insure safety against any operating shutdowns and delays which might accompany the use of less efficient pipe-line equipment.

CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

Branches and Sales Offices in One Hundred and Thirty-five Cities
National Exhibit Rooms: Chicago, New York, Atlantic City
Works: Chicago and Bridgeport

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$15.00 to 20.00
Boston (dealers)	15.50 to 16.50
Buffalo	19.50 to 20.50
Chicago	19.50 to 19.00
Cincinnati	16.50 to 17.50
Cleveland	19.00 to 19.50
Eastern Pennsylvania	17.50 to 18.50
New York (dealers)	13.50 to 14.00
Pittsburgh	21.00 to 21.50
San Francisco	11.50
St. Louis	17.25 to 17.75
Valleys	21.00 to 21.50
No. 1 railroad steel New York (dealers)	14.25 to 14.75

BUNDLED SHEETS

Buffalo	$14.00 to 15.00
Cleveland (hydraulic)	16.75 to 17.25
Cincinnati	13.00 to 14.00
Eastern Pennsylvania	15.50 to 16.00
Pittsburgh	17.00 to 18.00
St. Louis	10.00 to 10.50
Valleys (hydraulic)	19.00 to 19.50

STEEL RAILS, SHORT

Birmingham	$16.50 to 17.50
Boston (dealers)	15.50 to 16.50
Chicago	22.00 to 22.50
Cincinnati	17.50 to 18.00
Cleveland	16.25 to 17.00
St. Louis	20.50 to 21.00

STOVE PLATE

Birmingham	$17.00 to 18.00
Boston (consumers)	17.00 to 17.50
Buffalo	17.00 to 18.00
Chicago	19.75 to 20.25
Cincinnati (net)	15.00 to 16.00
Cleveland	17.00 to 17.75
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	14.00 to 14.50
Pittsburgh	18.00 to 18.50
St. Louis	17.50 to 18.00

LOW PHOSPHORUS

Buffalo	$21.00 to 22.00
Cincinnati	18.00 to 18.50
Eastern Pennsylvania	22.00 to 23.00
Pitts. billet and bloom crops	25.00 to 26.00

SHOVELING STEEL

Chicago	$18.25 to 18.75
Pittsburgh	18.00 to 18.50
St. Louis	16.50 to 17.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	$23.50 to 24.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	23.00 to 24.00
St. Louis	23.25 to 23.75

COMPRESSED SHEETS

Buffalo	$18.00 to 19.00
Chicago	16.00 to 16.50
Pittsburgh	18.50 to 19.50

FROGS, SWITCHES, GUARDS

Chicago	$18.50 to 19.00
Eastern Pennsylvania	17.50 to 18.50
St. Louis	19.00 to 19.50

BOILER PLATE, CUT

St. Louis (dealers)	13.00 to 13.50

ANGLE BARS—STEEL

Chicago	$20.50 to 21.00
St. Louis	20.25 to 20.75

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$20.00 to 22.00
Boston (dealers)	16.50 to 17.00
Buffalo	19.00 to 20.00
Chicago, No. 1	20.25 to 20.75
Chicago, No. 2	19.00 to 19.50
Cincinnati, No. 1	15.00 to 16.00
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	22.00 to 23.00
Pittsburgh, No. 1	19.00 to 20.00
Pittsburgh, No. 2	21.00 to 21.50
New York, No. 1 (dealers)	16.00 to 16.50
St. Louis, No. 1	20.50 to 21.00
St. Louis, No. 2	19.00 to 19.50

WROUGHT PIPE

Boston (dealers)	$11.00 to 11.50
Buffalo	14.00 to 14.50
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	11.75 to 12.25

YARD WROUGHT

Boston	$14.00 to 15.00
Eastern Pennsylvania, No. 1	19.50 to 20.50

CITY WROUGHT

New York, long	$13.50 to 14.00

BUSHELING

Buffalo, No. 1	$17.00 to 18.00
Chicago, No. 1	17.25 to 17.75
Chicago, No. 2	11.00 to 11.50
Cincinnati, No. 1	14.00 to 15.00
Cleveland, No. 1	14.00 to 14.25
Cleveland, No. 2	13.00 to 13.50
Eastern Pennsylvania, No. 1	14.50 to 15.00
Pittsburgh, No. 1	18.00 to 18.50
St. Louis, No. 1	15.75 to 16.75

MACHINE SHOP TURNINGS

Birmingham	$9.00 to 10.00
Boston (dealers)	11.50 to 12.00
Buffalo	14.50 to 15.50
Chicago	12.50 to 12.75
Cleveland	14.25 to 14.50
Cincinnati (net)	13.00 to 14.00
Eastern Pennsylvania	15.00 to 16.50
New York (dealers)	12.25 to 12.75
Pittsburgh	16.50 to 17.00
St. Louis	11.25 to 11.75
Valleys	15.75 to 16.00

CAST IRON BORINGS

Birmingham (chemical)	$15.00 to 16.00
Birmingham, borings (plain)	12.00 to 13.00
Boston (chemical)	17.00 to 17.50
Boston (dealers)	15.00 to 16.00
Buffalo	17.00 to 18.00
Chicago	15.25 to 15.75
Cincinnati (net)	13.00 to 14.00
Cleveland	15.00 to 15.50
Eastern Pennsylvania	16.50 to 17.00
Eastern Pennsylvania (chemical)	23.00 to 25.00
Pittsburgh	18.00 to 18.50
New York (dealers' price)	12.25 to 12.50
St. Louis	13.00 to 13.50
Valleys	17.25 to 17.50

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	$11.50 to 12.00
Cleveland, small	15.00 to 15.25
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	12.25 to 12.75

IRON AXLES

Birmingham	$24.00 to 25.50
Boston	27.00 to 28.00
Buffalo	24.00 to 25.00
Chicago	29.50 to 30.00
Cincinnati	23.00 to 24.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	23.00 to 24.00
Pittsburgh	29.00 to 30.00
St. Louis	29.50 to 30.00

IRON RAILS

Buffalo	$19.00 to 20.00
Chicago	23.50 to 24.00
Cincinnati	16.00 to 17.00
Cleveland	18.00 to 18.50
St. Louis	20.00 to 20.50

PIPES AND FLUES

Chicago	$14.75 to 15.25
Cincinnati	12.00 to 13.00
Cleveland	15.00 to 15.50
St. Louis	12.00 to 12.50

RAILROAD GRATE BARS

Buffalo	$16.00 to 17.00
Chicago	20.25 to 20.75
Cleveland	17.00 to 17.75
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	12.00 to 12.50
St. Louis	18.50 to 19.00

FORGE FLASHINGS

Boston (dealers)	$11.50 to 12.00
Chicago, small	12.00 to 12.50
Cleveland	14.75 to 15.25
Cleveland, large	13.50 to 13.75

FORGE SCRAP

Boston	$11.50 to 12.00
Chicago	19.00 to 19.50
Eastern Pennsylvania, No. 1	16.00 to 16.50

ARCH BARS AND TRANSOMS

Chicago	$25.50 to 26.00
St. Louis	24.00 to 24.50

ANGLE BARS—IRON

Chicago	$25.50 to 26.00
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$12.00 to 12.50
Buffalo	17.50 to 18.50
Chicago	16.00 to 16.50
Cleveland	17.00 to 17.25
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	18.50 to 19.50
St. Louis	13.00 to 13.50

STEEL CAR AXLES

Birmingham	$22.00 to 23.00
Boston (dealers)	23.50 to 24.00
Buffalo	21.00 to 22.00
Chicago	22.50 to 23.00
Cleveland	26.00 to 27.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	17.00 to 18.00
Pittsburgh	23.00 to 23.50
St. Louis	23.00 to 23.50

SHAFTING

Boston (dealers)	$18.50 to 19.50
Chicago	25.00 to 25.50
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	16.00 to 16.50
St. Louis	22.00 to 22.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$19.00 to 20.00
Birmingham, tram car	22.00 to 23.00
Boston (consumers)	18.50 to 19.50
Buffalo, iron	21.00 to 22.00
Chicago, iron	25.00 to 25.50
Cincinnati	19.00 to 19.50
Cleveland, iron	13.00 to 13.50
Eastern Pennsylvania, iron	22.00 to 23.00
New York, iron (dealers)	15.00 to 16.00
Pittsburgh, iron	23.50 to 24.00
Pittsburgh, steel	23.00 to 24.00
St. Louis, iron	24.50 to 25.00

NO. 1 CAST SCRAP

Birmingham, cupola	$21.00 to 23.00
Boston (consumers)	22.00 to 23.00
Buffalo	21.00 to 22.00
Chicago, cupola	24.00 to 24.50
Cincinnati, No. 1, machinery, cupola (net)	19.50 to 20.00
Cleveland, cupola	21.00 to 21.75
Eastern Pennsylvania, cupola	23.00 to 25.00
New York, cupola (dealers)	19.50 to 20.00
Pittsburgh, cupola	23.50 to 24.00
San Francisco	26.00
St. Louis, agricultural	22.50 to 23.00
St. Louis, railroad	22.50 to 23.00
Valleys	22.00 to 22.50

HEAVY CAST

Boston (consumers)	$19.50 to 20.00
Buffalo	18.00 to 19.00
Cleveland	17.00 to 17.25
Eastern Pennsylvania	20.50 to 21.50
New York (dealers)	17.00 to 18.00
Pittsburgh	20.00 to 20.50

MALLEABLE

Boston (railroad)	$19.50 to 20.00
Buffalo	20.50 to 21.50
Chicago, railroad	24.50 to 25.00
Chicago, agricultural	24.50 to 25.00
Cincinnati, agricultural	16.00 to 17.00
Cincinnati, railroad	17.00 to 18.00
Cleveland, agricultural	18.50 to 19.00
Cleveland, railroad	20.00 to 21.00
Eastern Pennsylvania, railroad	20.00 to 21.00
Pittsburgh, railroad	21.50 to 22.00
Pittsburgh, agricultural	18.00 to 18.50
St. Louis, agricultural	22.00 to 22.50
St. Louis, railroad	22.00 to 22.50

Miscellaneous Scrap

RAILS FOR ROLLING

3 feet and over

Birmingham	$21.00 to 22.00
Boston (dealers)	15.50 to 16.00
Chicago	20.50 to 21.00
Cleveland	23.00 to 24.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	13.50 to 14.50
Pittsburgh district	24.50 to 25.00
St. Louis	21.00 to 21.50

LOCOMOTIVE TIRES

Chicago	$21.50 to 22.00
St. Louis	19.00 to 19.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$19.50 to 20.00
Eastern Pennsylvania	22.00 to 24.00
Pittsburgh	24.00 to 25.00